

OXFORD



Mathematical Literacy

CRITICAL CONCEPTS MADE EASY

Worked Solutions **11**

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Topic 1 Measurement: Conversion ANSWERS

Worksheet 1: Basic conversions

- 1.1 $10,5 \text{ km} \times 100\,000 \checkmark = 1\,050\,000 \text{ cm} \checkmark$
- 1.2 $2\,456 \text{ L} \div 1\,000 \checkmark = 2,456 \text{ kL} \checkmark$
- 1.3 $2\,500 \text{ kg} \div 1\,000 \checkmark = 2,5 \text{ tonnes} \checkmark$
- 1.4 $2\,809 \text{ g} \div 1\,000 \checkmark = 2,809 \text{ kg} \checkmark$
-
- 2.1 $3 \text{ cups} \times 250 \text{ mL} \checkmark = 750 \text{ mL} \checkmark$
- 2.2 $(6 \text{ tbsp} \times 15 \checkmark) + (3 \text{ tsp} \times 5 \checkmark) = 105 \text{ mL} \checkmark$
- 2.3 $(5 \text{ feet} \times \frac{304,8}{10} \checkmark) + (5 \text{ inches} \times \frac{25,4}{10} \checkmark) = 152,4 \text{ cm} \checkmark + 12,7 \text{ cm} \checkmark = 165,1 \text{ cm} \checkmark$
- 2.4 $(12 \text{ pounds} \times \frac{453,5924}{1\,000} \checkmark) + (8 \text{ ounces} \times \frac{28,3495}{1\,000} \checkmark) \text{ (g} \rightarrow \text{kg)}$
 $= 5,443 \text{ kg} \checkmark + 0,226 \text{ kg} \checkmark = 5,669 \text{ kg} \checkmark$
-
- 3.1 $1,609 \text{ km} = 1 \text{ mile} \checkmark$
 $1 \text{ km} = \frac{1}{1,609} \text{ mile}$
 $42,2 \text{ km} = \frac{1}{1,609} \checkmark \times 42,2 \text{ miles} \checkmark$
 $= 26,227 \text{ miles} \checkmark$
- 3.2 $(453,5924 \text{ g} \div 1\,000 \checkmark) \text{ kg} = 1 \text{ pound} \checkmark$
 $12,86 \text{ kg} = \frac{1}{0,4535924} \checkmark \times 12,86 \checkmark$
 $= 28,351 \text{ pounds} \checkmark$
- 3.3 $25,4 \text{ mm} = 1 \text{ inch} \checkmark$
 $381 \text{ mm} = \frac{1}{25,4} \times 381 \checkmark$
 $= 15 \text{ inches} \checkmark$
-
- 3.4 $\frac{304,8}{1000} \checkmark \text{ m} = 1 \text{ foot} \checkmark$
 $1,89 \text{ m} = \frac{1}{0,3048} \times 1,89 \checkmark$
 $= 6,201 \text{ feet} \checkmark$
-
- 3.5 $\frac{453,592}{1\,000\,000} \checkmark \text{ tonne} = 1 \text{ pound} \checkmark$
 $6,8 \text{ tonne} = \frac{1}{0,000453592} \times 6,8 \checkmark$
 $= 14\,991,446 \text{ pounds} \checkmark$
-
- 4.1 $(76^\circ\text{F} - 32) \div 1,8 \checkmark = 24,4^\circ\text{C} \checkmark$
- 4.2 $200^\circ\text{C} \times 1,8 + 32 \checkmark = 392^\circ\text{F} \checkmark$
- 4.3 $(-30^\circ\text{F} - 32) \div 1,8 \checkmark = -34,4^\circ\text{C} \checkmark$
-
- 5.1 $14 \text{ hours} \times 60 \checkmark \times 60 \checkmark = 50\,400 \text{ seconds} \checkmark$
- 5.2 $5,5 \text{ years} \times \checkmark 365 \checkmark$
 $= 2007,5 \text{ days} \checkmark$
 $= 2007 \text{ days } (0,5 \times 24) \checkmark$
 $= 2007 \text{ days } 12 \text{ hours} \checkmark$
- 5.3 $102 \text{ months} \div 12 \checkmark = 8,5 \text{ years} \checkmark = 8 \text{ years } 6 \text{ months} \checkmark$

Worksheet 2: Advanced conversions

1.1 $86,73 \text{ km} \times \checkmark 0,6214 \checkmark = 53,894 \text{ miles} \checkmark$

1.2
$$\begin{array}{r} 5:30 \\ +5:35:34 \checkmark \\ \hline 11:05:34 \checkmark \end{array}$$

1.3
$$\begin{aligned} \text{Speed} &= 86,73 \text{ km} \div 5\text{h}35 \\ &= 86,73 \div \left(\frac{(5 \times 60 + 35)}{60}\right) \checkmark \checkmark \\ &= 86,73 \text{ km} \div 5,583 \text{ h} \checkmark \\ &= 15,535 \text{ km/h} \checkmark \end{aligned}$$

2.1 $(2 + \frac{1}{2}) \times 15 \text{ mL} = 2,5 \times 15 \text{ mL} \checkmark = 37,5 \text{ mL} \checkmark$

2.2 $250 \text{ mL} \checkmark \times \frac{2}{3} \checkmark = 166,67 \text{ mL} \approx 170 \text{ mL} \checkmark$

2.3 $250 \text{ mL} \checkmark \div 4 \checkmark = 62,5 \text{ mL} \checkmark \approx 65 \text{ mL} \checkmark$

3. $^{\circ}\text{C} = (350^{\circ}\text{F} - 32) \div 1,8 \checkmark = 176,6^{\circ}\text{C} \checkmark \approx 180^{\circ}\text{C} \checkmark \checkmark$

4. $72 \text{ inches} \times \checkmark 25,4 \text{ mm} = 1\,828,8 \text{ mm} \checkmark$
 $1\,828,8 \text{ mm} - \checkmark 597 \text{ mm} = 1\,231,8 \text{ mm} \checkmark$

5. $46\text{mm} \div \checkmark 25,4 \text{ mm} = 1,81 \text{ inches} \checkmark$

6. $\frac{186\text{km}}{1\text{h}} \times \checkmark \frac{1\,000 \checkmark}{60 \times 60 \checkmark} = \frac{186\,000 \text{ m}}{3600\text{s}} \checkmark = 51,67 \text{ m/s} \checkmark$

7.1
$$\begin{aligned} &\frac{(100-2)}{100} \checkmark \times (365 \text{ days} \times 24 \text{ hours}) \checkmark \\ &= \frac{98}{100} \times 8\,760 \text{ hours} \checkmark \\ &= 8\,584,8 \text{ hours} \\ &= 8\,584 \text{ h } (0,8 \times 60) \text{ min} \checkmark \\ &= 8\,584 \text{ h } 48 \text{ min} \checkmark \end{aligned}$$

7.2
$$\begin{array}{r} 59 \checkmark \quad 60 \checkmark \\ 8\,760 \text{ h } 00 \text{ min} \\ - 8\,584 \text{ h } 48 \text{ min} \\ \hline 175 \text{ h } 12 \text{ min} \checkmark \end{array}$$

$(175 \text{ h} \checkmark + \frac{12}{60} \text{ h} \checkmark) = 175,2 \text{ h} \checkmark$

$175,2 \div 24 \checkmark = 7,3 \text{ days}$

$7 \text{ days } (0,3 \times 24 \text{ h}) \checkmark = 7 \text{ days and } 7,2 \text{ hours} \checkmark = 7 \text{ days } 7 \text{ hours } (0,2 \times 60) \checkmark \text{ min}$
 $\approx 7 \text{ days } 7 \text{ hours } 12 \text{ min of calm conditions} \checkmark$

8.1 $(8\,969 \text{ m}^3 - 8\,945 \text{ m}^3) \checkmark \times 1\,000 \checkmark = 24\,000 \text{ litres} \checkmark$

8.2 $24\,000 \text{ litres} \div 31 \text{ days} \checkmark \div 4 \text{ persons} \checkmark = 193,548 \text{ litres} \checkmark$

9.1 $138\,000 \text{ tonnes} \times 1\,000 \checkmark = 138\,000\,000 \text{ kg}$
 $\therefore \text{one hundred and thirty-eight million kilograms} \checkmark$

9.2 $138\,000\,000 + \checkmark (177\,000 \text{ tonnes} \times 1\,000) \checkmark = 315\,000\,000 \text{ kg} \checkmark$

Worksheet 3: Scale

- 1.1 Number scale or ratio scale ✓
1.2 Bar scale ✓
2. The object on the map or plan ✓ is 150 times ✓ smaller ✓ than the object is in real life.
OR
The object is 150 times ✓ bigger ✓ in real life ✓ than on the map or plan.
- 3.1 $15 \text{ mm} \times 150 \checkmark = 2\,250 \text{ mm} \checkmark$
 $2\,250 \text{ mm} \div 1\,000 \checkmark = 2,25 \text{ m} \checkmark$
- 3.2 $12 \text{ cm} \times 150 \checkmark = 1\,800 \text{ cm} \checkmark$
 $1\,800 \div 100 \checkmark = 18 \text{ m} \checkmark$
- 3.3 $105,5 \text{ mm} \times 150 \checkmark = 15\,825 \text{ mm} \checkmark$
 $15\,825 \text{ mm} \div 1\,000 \checkmark = 15,825 \text{ m} \checkmark$
4. $5,5 \text{ cm} = 500 \text{ m}; 1 \text{ cm} = \frac{500}{5,5} \text{ m}$
- 4.1 $8 \text{ cm} \times \frac{500}{5,5} \checkmark = 727,273 \text{ m} \checkmark \approx 727,3 \text{ m} \checkmark$
- 4.2 $\frac{116}{10} \checkmark \text{ cm} \times \frac{500}{5,5} \checkmark = 1\,054,545 \text{ m} \checkmark \approx 1\,054,5 \text{ m} \checkmark$
- 4.3 $\frac{25,5 \text{ mm}}{10} \checkmark \text{ cm} \times \frac{500}{5,5} \checkmark = 231,818 \text{ m} \checkmark \approx 231,8 \text{ m} \checkmark$
- 5.1 $12,8 \text{ mm} \times 100 \checkmark = 1\,280 \text{ mm} \checkmark$
 $1\,280 \div 1\,000 \checkmark = 1,28 \text{ m} \checkmark$
- 5.2 $12,8 \text{ mm} \times 120 \checkmark = 1\,536 \text{ mm} \checkmark$
 $1\,536 \text{ mm} \div 10 \checkmark = 153,6 \text{ cm} \checkmark$
- 5.3 $12,8 \text{ mm} \times 10\,000 \checkmark = 128\,000 \text{ mm} \checkmark$
 $128\,000 \text{ mm} \div 1\,000\,000 \checkmark = 0,128 \text{ km} \checkmark$
6. $2 \text{ cm} = 10 \text{ km} \checkmark$
 $1 \text{ cm} = \frac{10}{2} \text{ km} \checkmark$
 $1 \text{ cm} = 5 \text{ km} \checkmark$
 $12,5 \text{ cm} \times 5 \checkmark = 62,5 \text{ km} \checkmark$
7. We want to scale 6 cm to 4,2 m ✓
 $6 \text{ cm} : (4,2 \times 100) \text{ cm} \checkmark \checkmark$
 $6 : 420 \checkmark$
 $1 : \frac{420}{6} \checkmark$
 $1 : 70 \checkmark$
Similarly, we could scale 4 cm to 2,8 m and also get 1 : 70
8. $7,5 \text{ cm} : 6 \text{ m} \checkmark$
 $7,5 \text{ cm} \times 10 : 6 \text{ m} \times 1\,000 \checkmark$
 $75 \text{ mm} : 6\,000 \text{ mm} \checkmark$
 $1 : \frac{6\,000}{75} \checkmark$
 $1 : 80 \checkmark$
9. Yes. ✓ The bar scale is enlarged with the map or plan ✓ and therefore the ratio ✓ between the measurements are kept. ✓

Worksheet 4: Currency

1. An exchange rate is the price of one nation's currency, SA rand, in terms of another currency, Australian Dollar ✓. 1 AUD costs R10,5423. ✓

2.1 100 Singapore Dollar $\times$ R10,00 ✓ $\approx$ R1 000 ✓

2.2 200 Australian Dollar $\times$ R10 ✓ $\approx$ R2 000 ✓

2.3 1 000 Indian Rupee $\times \frac{2}{10}$ ✓ $= 1\,000 \div 5$ ✓ $\approx$ R200 ✓

3.1 185 Euro $\times$ R15,7569 ✓ $=$ R2 915,026 $\approx$ R2 915,03 ✓

3.2 250 Botswana Pula $\times$ R1,3048 ✓ $=$ R326,20 ✓

3.3 15 000 Indian Rupee $\times$ R0,2043 ✓ $=$ R3 064,50 ✓

4.1 R13,3684 = 1 USD ✓

$$R1 = \frac{1}{13,3684}$$

$$\begin{aligned} R2\,500 &= \frac{1}{13,3684} \times R2\,500 \checkmark \\ &= R187,008 \\ &\approx R187,01 \checkmark \end{aligned}$$

OR

$$\begin{aligned} \frac{R2\,500 \checkmark}{13,3684 \checkmark} &= R187,008 \\ &\approx R187,01 \checkmark \end{aligned}$$

4.2 R10,5423 = 1 AUD ✓

$$R1 = \frac{1}{10,5423}$$

$$\begin{aligned} R2\,500 &= \frac{1}{10,5423} \times R2\,500 \checkmark \\ &= R237,139 \\ &\approx R237,14 \checkmark \end{aligned}$$

OR

$$\begin{aligned} \frac{R2\,500 \checkmark}{10,5423 \checkmark} &= R237,139 \\ &\approx R237,14 \checkmark \end{aligned}$$

4.3 R9,8699 = 1 SGD ✓

$$R1 = \frac{1}{9,8699}$$

$$\begin{aligned} R2\,500 &= \frac{1}{9,8699} \times R2\,500 \checkmark \\ &= R253,295 \\ &\approx R253,30 \checkmark \end{aligned}$$

OR

$$\begin{aligned} \frac{R2\,500 \checkmark}{9,8699 \checkmark} &= R253,295 \\ &\approx R253,30 \checkmark \end{aligned}$$

5.1 USD 1 379,99 $\times$ R13,3684 ✓ $=$ R18 448,258 $\approx$ R18 448,26 ✓

5.2 R13,3684 = 1 USD ✓

$$R1 = \frac{1}{13,3684}$$

$$\begin{aligned} R56\,686,17 &= \frac{1}{13,3684} \times R56\,686,17 \checkmark \\ &= 4\,240,31 \text{ USD } \checkmark \end{aligned}$$

OR

$$\frac{R256\,686,17 \checkmark}{13,3684 \checkmark} = R4\,240,31 \checkmark$$

5.3 Custom duties ✓✓ are imposed on all imported goods by SARS with the aim to raise revenue. Other costs are transporting/shipping costs. ✓✓

6.1 No. of days: 6 days ✓ (he is leaving the Thursday; therefore, it is not part of his stay)

Daily cost in Baht: $7\,804,37 \div 6$ ✓ $= 1\,300,7283$ ✓

Daily cost in Rand: $1\,300,7283 \text{ Baht} \times \checkmark R0,40362 \checkmark = R524,999 \approx R525,00 \checkmark$

6.2 1 785 Thai Baht $\times \checkmark R0,50345 \checkmark = R898,658 \approx R898,66 \checkmark$

6.3 1 785 Thai Baht $\times R0,40362 \checkmark = R720,4617 \approx R720,46 \checkmark$

The rand has weakened (decreased in value) ✓ in comparison to the baht. He received more money than he would have that means if he bought it he would have paid more. ✓

OR

0,40362 ZAR = 1 THB

$$\begin{aligned} 1 \text{ ZAR} &= \frac{1}{0,40362} \\ &= 2,4776 \text{ THB } \checkmark \end{aligned}$$

$$0,50345 \text{ ZAR} = 1 \text{ THB}$$

$$1 \text{ ZAR} = \frac{1}{0,50345}$$

$$= 1,9863 \checkmark$$

The rand has weakened $\checkmark$ in comparison to the baht. After the change in currency rate 1 rand buys 1,9863 THB where before it bought 2,4776 THB. $\checkmark$

Exam-type questions: Paper 1

$$1.1 \quad 100 \text{ m (Decathlon Boys)} \checkmark; 09:30 \checkmark$$

$$1.2 \quad \begin{array}{r} (85 \text{ min}) 60 \text{ min} + 25 \text{ min} \checkmark \\ 10:25 \\ - 09:30 \checkmark \\ \hline 55 \text{ min} \checkmark \end{array}$$

$$1.3 \quad 5 \text{ kg} \times 1\,000 \checkmark = 5\,000 \text{ g} \checkmark$$

$$1.4 \quad \left. \begin{array}{r} 19:40 \checkmark \\ - \checkmark 09:30 \\ \hline 10 \text{ h } 10 \text{ min} \checkmark \end{array} \right\} \checkmark \text{ correct times}$$

$$1.5 \quad 2,24 \text{ m} \checkmark - 1,85 \text{ m} = 0,39 \text{ m} \therefore 0,39 \text{ m} \times 100 \checkmark = 39 \text{ cm} \checkmark$$

$$1.6 \quad \frac{400 \text{ m} \checkmark}{52,5 \text{ s}} = 7,62 \text{ m/s} \checkmark$$

$$1.7 \quad 010814 \rightarrow 14^{\text{th}} \text{ August } 2001 \checkmark$$

$$2017 - 2001 = 16 \text{ years} \checkmark$$

As he turned 16 in August, it means he was still 15 years $\checkmark$ and 11 months $\checkmark$ old at the start of the IAAF championships.

$$1.8 \quad \begin{array}{l} 9:30 \text{ am} \checkmark \\ 7:40 \text{ pm} \checkmark \end{array}$$

$$1.9 \quad \frac{5}{17} \checkmark \times 100 \checkmark = 29,4\% \checkmark$$

$$1.10 \quad 3:9 \checkmark \therefore 1:3 \checkmark$$

$$1.11 \quad 125\,000 \times 75 \text{ KES} \checkmark = 9\,375\,000 \text{ KES} \checkmark$$

$$1.12 \quad \frac{71,4 \text{ kg} \checkmark}{(1,96 \text{ m})^2 \checkmark} \checkmark \checkmark = 18,586 \approx 18,6 \text{ kg/m}^2 \checkmark$$

$$2.1.1 \quad 1 \text{ NGN} = \text{R}0,03807 \checkmark \checkmark$$

$$2.1.2 \quad 1 \text{ KES} = \text{R}0,13153 \checkmark \checkmark$$

$$2.2 \quad \text{You need } \text{R}13,5745 \checkmark \text{ to buy one US dollar} \checkmark$$

OR One US dollar $\checkmark$ will be exchanged for $\text{R}13,5745 \checkmark$ in South Africa.

$$2.3.1 \quad \text{The South African rand was stronger} \checkmark \text{ as you got } 7,60308 \text{ KES} \checkmark \text{ for every rand} \checkmark \text{ you exchange.}$$

$$2.3.2 \quad 88 \text{ KES} \checkmark \div 8 \checkmark \approx \text{R}11,00 \checkmark$$

$$2.3.3 \quad \text{R}172,95 \div 24 = \text{R}7,21$$

$$86,89 \text{ KES} = \frac{86,89}{7,60308} = \text{R}11,43 \checkmark$$

A cold drink was more expensive in Nairobi than in South Africa. $\checkmark$

Exam-type questions: Paper 2

$$\begin{aligned} 1.1 \quad \text{Area} &= 2 \times \left(3,142 \times \left(\frac{95 \text{ mm}}{2}\right)^2\right) + \left(2 \times 3,142 \times \frac{95 \text{ mm}}{2} \times [25 \text{ cm} \times 10]\right) \text{ mm} \\ &= 14\,178,275 \text{ mm}^2 + 74\,622,5 \text{ mm}^2 \\ &= 88\,800,775 \text{ mm}^2 \\ &\therefore 88\,800,775 \text{ mm}^2 \div 1\,000\,000 = 0,0888 \text{ m}^2 \approx 0,089 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} 1.2.1 \quad \text{Volume} &= 22 \text{ cm} \times 8,5 \text{ cm} \times (90 \div 10) \text{ mm} \\ &= 1\,683 \text{ cm}^3 \end{aligned}$$

$$\begin{aligned} 1.2.2 \quad 0,39370079 \text{ inches} &= 1 \text{ cm} \\ 1 \text{ inch} &= \frac{1}{0,39370079} \text{ cm} \\ 7,5 \text{ inches} &= \frac{1}{0,39370079} \text{ cm} \times 7,5 \\ &= 19,049 \text{ cm} \end{aligned}$$

$$\begin{aligned} 1.2.3 \quad \text{No. of pencils fitting in width of pencil case} &= 8,5 \text{ cm} \div 1,2 \text{ cm} \\ &= 7,08 \\ &\approx 7 \text{ pencils} \\ \text{No. of pencils fitting in height of pencil case} &= 9 \text{ cm} \div 1,2 \text{ cm} \\ &= 7,5 \\ &\approx 7 \text{ pencils} \\ \text{Total number of pencils fitting in pencil case} &= 7 \times 7 = 49 \text{ pencils} \\ \text{Yes, a pack of 48 pencils will fit into the pencil case.} \end{aligned}$$

$$\begin{aligned} 2.1 \quad \text{Volume} &= \pi r^2 h \\ &= 3,142 \times (1)^2 \text{ cm} \times \frac{125 \text{ mm}}{10} \\ &= 39,28 \text{ cm}^3 \\ &\therefore 39,28 \text{ cm}^3 \div 1\,000 = 0,03928 \text{ L} \\ &= 0,039 \text{ L} \end{aligned}$$

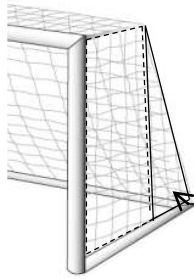
$$\begin{aligned} 2.2 \quad \text{Width of roof} &= \sqrt{\left(\frac{7,8}{2} + (45 \div 100) \text{ m}\right)^2 + (1,2)^2} \\ &= \sqrt{(4,35)^2 + (1,2)^2} \text{ m} \\ &= 4,5125 \text{ m} \\ \text{Area of half of the roof} &= 9,8 \text{ m} \times 4,5125 \text{ m} \\ &= 44,22 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} 2.3 \quad \text{Volume in litres:} \\ &= (0,125 \text{ m}) \times (44,22 \text{ m}^2 \times 2) \times 0,9 \times 1\,000 \\ &= 9\,949,5 \text{ L} \end{aligned}$$

$$\begin{aligned} 2.4 \quad 9\,949,5 \text{ L} \div 2 &= 4\,974,75 \text{ L on each half of the roof} \\ 4\,974,75 \text{ L} \div 1\,000 &= 4,97 \text{ kL} \\ 4,97 \text{ kL} &< 5 \text{ kL} \\ \text{Yes, each 5-kL tank will be large enough.} \end{aligned}$$

$$\begin{aligned} 3.1 \quad 3,281 \text{ feet} &= 1 \text{ m} \\ 1 \text{ foot} &= \frac{1}{3,281} \text{ m} \\ 8 \text{ feet} &= \frac{1}{3,281} \times 8 \\ &= 2,438 \text{ m} \\ 1,094 \text{ yards} &= 1 \text{ m} \\ 1 \text{ yard} &= \frac{1}{1,094} \text{ m} = 0,9144 \text{ m} \\ 8 \text{ yards} &= 0,9144 \times 8 \\ &= 7,315 \text{ m} \\ 80 \text{ cm} \div 100 &= 0,8 \text{ m} \end{aligned}$$

3.2



Total area = Area of rectangle + Area of triangle

$$\text{Length} = 1,7\text{m} - 0,8\text{m} = 0,9\text{m}$$

$$\begin{aligned}\text{Area of triangle} &= \frac{1}{2} b \times h \\ &= 0,5 \times 0,9 \text{ m} \checkmark \times 2,438 \text{ m} \checkmark \\ &= 1,097 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{Area of rectangle} &= l \times b \\ &= 2,438 \text{ m} \checkmark \times 0,8 \text{ m} \checkmark \\ &= 1,950 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{Total area of side} &= 1,097 + \checkmark 1,95 \\ &= 3,047 \text{ m}^2 \checkmark\end{aligned}$$

3.3 0,621 mile = 1 km

$$1 \text{ mile} = \frac{1}{0,621} \text{ km}$$

$$\begin{aligned}75 \text{ miles} &= \frac{1}{0,621} \checkmark \times 75 \checkmark \\ &= 120,773 \text{ km}\end{aligned}$$

$$1 \text{ yard} = 0,9144 \text{ m}$$

$$\begin{aligned}40 \text{ yards} &= 0,9144 \times 40 \text{ m} \checkmark \\ &= 36,576 \text{ m}\end{aligned}$$

$$\text{Speed} = \text{Distance} \div \text{Time}$$

$$\begin{aligned}\therefore \text{Time} &= \text{Distance} \div \text{speed} \checkmark \\ &= (36,576 \div 1\,000 \checkmark) \text{ km} \div 120,773 \text{ km/h} \checkmark \\ &= 0,0003028 \text{ h} \\ &\approx 0,0003 \text{ h} \checkmark\end{aligned}$$

NB! Unit = hours

NB! Same units
km and km

$$\therefore (0,0003 \times 60 \checkmark \times 60 \checkmark) \text{ seconds} = 1,08 \text{ s} \checkmark$$

Topic 2 Measurement: Application ANSWERS

Worksheet 1: Simple perimeter and area

- 1.1 $\frac{180 \text{ cm}}{100} \checkmark \div 3 \checkmark = 0,6 \text{ m} \checkmark$
- 1.2 $\frac{2}{3} \times 0,6 \text{ m} \checkmark = 0,4 \text{ m} \checkmark$
- 1.3 $\frac{200 \text{ mm}}{1000} \checkmark + 0,6 \text{ m} + (0,6 \text{ m} - 0,2 \text{ m}) \checkmark + 0,6 \text{ m} + (0,6 \text{ m} - 0,4 \text{ m}) \checkmark$
 $+ 0,6 + 0,4 \text{ m} + 1,8 \checkmark$
 $= 4,8 \text{ m} \checkmark$
OR
 $1,8 \text{ m} + (3 \times 0,6 \text{ m}) + \frac{200 \text{ mm}}{1000} \checkmark + 0,4 \text{ m} + 0,2 + (0,6 \text{ m} - 0,2 \text{ m}) \checkmark$
 $+ (0,6 \text{ m} - 0,4 \text{ m}) \checkmark \checkmark$
 $= 4,8 \text{ m} \checkmark$
- 1.4 Total area = Area 3 + Area 1 + Area 2
 $= (0,2 \text{ m} \times 0,6 \text{ m}) \checkmark + (0,6 \text{ m} \times 0,6 \text{ m}) \checkmark + (0,6 \text{ m} \times 0,4 \text{ m}) \checkmark \checkmark$
 $= 0,12 \text{ m}^2 + 0,36 \text{ m}^2 + 0,24 \text{ m}^2$
 $= 0,72 \text{ m}^2 \checkmark$
- 2.1 $92 \text{ inches} = 92 \times 25,4 \text{ mm} \checkmark = 2\,336,8 \text{ mm}$
 $\therefore 2\,336,8 \div 1000 \checkmark = 2,3368 \text{ m}$
 $\approx 2,337 \text{ m} \checkmark$
- 2.2 $3,68 \div 2 = 1,84 \text{ m}$
 $A = B + \frac{5 \text{ cm}}{100} \checkmark \therefore A = B + 0,05 \text{ m} \text{ and } A + B = \frac{3,68}{2} \text{ m} \checkmark$
 $\therefore B + 0,05 \text{ m} + B = 1,84 \text{ m} \checkmark$
 $2 \times B + 0,05 \text{ m} = 1,84 \text{ m}$
 $2 \times B = 1,84 \text{ m} - 0,05 \text{ m} \checkmark$
 $B = (1,84 \text{ m} - 0,05 \text{ m}) \div 2 \checkmark$
 $B = 0,895 \text{ m} \checkmark$
And $A = 0,895 \text{ m} + 0,05 \text{ m} = 0,945 \text{ m} \checkmark$
- 2.3 $\text{Web2} = (\frac{54 \text{ cm}}{100})^2 \checkmark + (0,895)^2 \checkmark = 0,2916 + 0,801$
 $\text{Web} = \sqrt{1,0926} \checkmark = 1,0453 \text{ m} \approx 1,045 \text{ m} \checkmark$
- 2.4 Total length of truss
 $= \text{bottom chord} + (2 \times \text{upper chord}) + \text{king post} + (2 \times \text{post}) + (2 \times \text{web}) \checkmark$
 $= 3,68 \text{ m} + (2 \times 2,337 \text{ m}) + (\frac{93 \text{ cm}}{100}) \checkmark + (2 \times 0,54 \text{ m}) + (2 \times 1,045 \text{ m}) \checkmark$
 $= 12,454 \text{ m} \checkmark$
- 3.1 Circumference $= 2 \times 3,142 \times \frac{100 \div 100 \checkmark (\text{cm} \rightarrow \text{m})}{2 \checkmark (d \rightarrow r)}$
 $= 2 \times 3,142 \times 0,5 \text{ m} \checkmark$
 $= 3,142 \text{ m} \checkmark$
- 3.2 Radius $= (1 \text{ m} \div 2) \checkmark - \frac{300}{1000} \checkmark$
 $= 0,2 \text{ m}$
Circumference $= 2 \times 3,142 \times 0,2 \checkmark$
 $= 1,257 \text{ m} \checkmark$
- 3.3 Area $= 3,142 \times (0,5 \text{ m})^2 \checkmark$
 $= 0,786 \text{ m}^2 \checkmark$
- 3.4 Area of ring $= 0,786 \text{ m}^2 - (3,142 \times 0,22) \checkmark$
 $= 0,786 \text{ m}^2 - 0,1257 \text{ m}^2$
 $= 0,6603$
 $\approx 0,66 \text{ m}^2 \checkmark$
- 4.1 Area of 2 uprights $= 2 (l \times b)$
 $= 2 \times 6 \text{ m} \times 1,2 \text{ m}$
 $= 14,4 \text{ m}^2 \checkmark$
Crossbar: Length $= 6 \text{ m} - (2 \times 2,5 \text{ m}) = 1 \text{ m} \checkmark$
Width $= 3 \text{ m} - (2 \times 1,2 \text{ m}) = 0,6 \text{ m} \checkmark$
Area of crossbar $= 1 \text{ m} \times 0,6 \text{ m} = 0,6 \text{ m}^2 \checkmark$
Total area $= 14,4 \text{ m}^2 + 0,6 \text{ m}^2 \checkmark = 15 \text{ m}^2 \checkmark$

- 4.2 Diameter of entire helipad = $12,6 \text{ m} + (2 \times 1,2 \text{ m}) = 15 \text{ m} \checkmark$
 Radius = $\frac{15 \text{ m}}{2} \checkmark = 7,5 \text{ m} \checkmark$
- 4.3 Area of ring = $(3,142 \times 7,52) - (3,142 \times (4+1)^2) \checkmark$
 $= 176,7375 \text{ m}^2 - 78,55 \text{ m}^2$
 $= 98,1875 \text{ m}^2$
 $\approx 100 \text{ m}^2 \checkmark$
- 4.4 Total area $\div$ coverage rate = $100 \text{ m}^2 \div 6 \text{ m}^2/\text{L} \checkmark = 16,6 \text{ L} \approx 17 \text{ L} \checkmark$
 $17 \text{ L} \div 5 \text{ L} \checkmark = 3,4 \text{ tins} \approx 4 \text{ tins} \checkmark$

Worksheet 2: Advanced perimeter and area

- 1.1 Area of front = Total area of triangle - $(3 \times \text{area of circle}) \checkmark$
 $= \frac{7,5 \times 6,5}{2} \checkmark - (3 \times 3,142 \times (\frac{2,1}{2} \checkmark)^2) \checkmark$
 $= 24,375 \text{ cm}^2 \approx 10,392 \text{ cm}^2$
 $= 13,983 \text{ cm}^2$

If asked for answer in m^2 :
 $\therefore 13,983 \text{ cm}^2 \div 10\,000 =$
 $0,0013983 \text{ m}^2 \approx 0,001 \text{ m}^2$

Area front and back = $2 \times \checkmark 13,983 \text{ cm}^2 = 27,966 \text{ cm}^2$

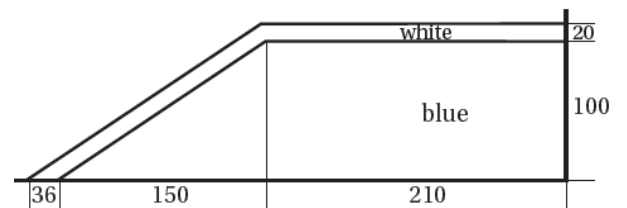
Three equal sides = $3 \times \checkmark (3 \text{ cm} \times 7,5 \text{ cm}) \checkmark$ (* The sides are rectangular)
 $= 67,5 \text{ cm}^2$

Insides of the 3 circles: height $\times$ circumference of circle
 $= 3 \times \checkmark (3 \text{ cm} \times 2 \times 3,142 \times 1,05 \text{ cm}) \checkmark$
 $= 59,3838 \text{ cm}^2$

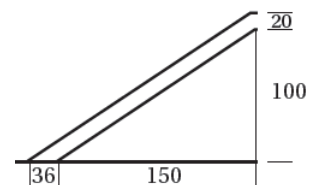
Total area = $27,966 \text{ cm}^2 + 67,5 \text{ cm}^2 + 59,3838 \text{ cm}^2 \checkmark \checkmark \checkmark$
 $= 154,8498 \text{ cm}^2$
 $\approx 154,850 \text{ cm}^2 \checkmark$

- 1.2 Surface area of cylinder = $(2 \times \text{area of top/base}) + (\text{area of side}) \checkmark$
 $= 2 \times 3,142 \times (\frac{2,1 - 0,1 \text{ cm} \checkmark}{2})^2 \checkmark + \checkmark (2 \times 3,142 \times 1 \text{ cm} \times 16 \text{ cm}) \checkmark$
 $= 6,284 \text{ cm}^2 + 100,544 \text{ cm}^2$
 $= 106,828 \text{ cm}^2 \checkmark$

- 2.1 Blue area = Area of rectangle + Area of triangle
 $= (210 \text{ mm} \times 100 \text{ mm}) \checkmark + \checkmark (\frac{1}{2} \times 150 \text{ mm} \times 100 \text{ mm}) \checkmark$
 $= 21\,000 \text{ mm}^2 + 7\,500 \text{ mm}^2$
 $= 28\,500 \text{ mm}^2 \checkmark$

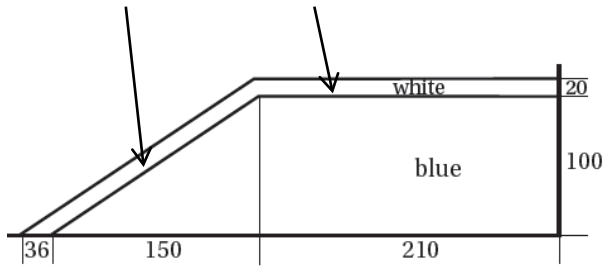


- 2.2 Area of blue triangle with white line:
 Base length = $150 \text{ mm} + 36 \text{ mm} = 186 \text{ mm}$
 Height = $100 \text{ mm} + 20 \text{ mm} = 120 \text{ mm}$



Area of white line with blue triangle
 $= (\text{Area of blue and white triangle}) - (\text{Area of blue triangle}) \checkmark$
 $= (\frac{1}{2} \times 186 \text{ mm} \times 120 \text{ mm}) \checkmark - 7\,500 \text{ mm}^2 \checkmark$
 $= 11\,160 \text{ mm}^2 - 7\,500 \text{ mm}^2$
 $= 3\,660 \text{ mm}^2 \checkmark$

Total white band = $3\,660\text{ mm}^2 + \checkmark (210\text{ mm} \times 20\text{ mm}) \checkmark$
 $= 3\,660\text{ mm}^2 + 4\,200\text{ mm}^2$



$= 7\,860\text{ mm}^2 \checkmark$

2.3 Area of black triangle = $\frac{1}{2} \times 180\text{ mm} \times 135\text{ mm} \checkmark$
 $= 12\,150\text{ mm}^2 \checkmark$

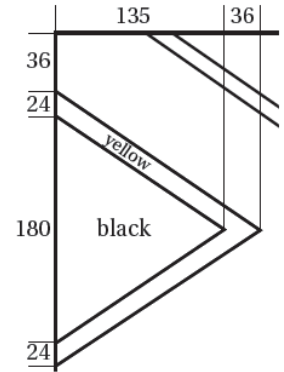
Large triangle = $\frac{1}{2} \times (180\text{ mm} + 24\text{ mm} + 24\text{ mm}) \times (135\text{ mm} + 36\text{ mm}) \checkmark$

$= \frac{1}{2} \times 228\text{ mm} \times 171\text{ mm}$

$= 19\,494\text{ mm}^2 \checkmark$

Area of yellow band = $19\,494\text{ mm}^2 - 12\,150\text{ mm}^2 \checkmark$

$= 7\,344\text{ mm}^2 \checkmark$



2.4 Red area + white band around red area = Blue area + white band around blue area

$\therefore 2 \times (28\,500\text{ mm}^2 + 7\,860\text{ mm}^2) \checkmark$

$= 2 \times 36\,360\text{ mm}^2 \checkmark$

$= 72\,720\text{ mm}^2 \checkmark$

Area black triangle with yellow band = large triangle = $19\,494\text{ mm}^2$

Total area (not green) = $72\,720\text{ mm}^2 + 19\,494\text{ mm}^2 \checkmark = 92\,214\text{ mm}^2 \checkmark$

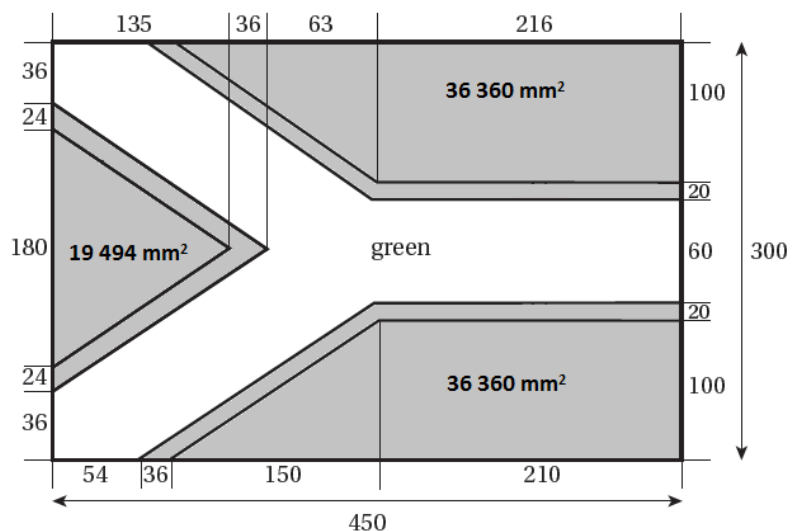
Total area of flag = length $\times$ breadth

$= (450\text{ mm} \times 300\text{ mm}) \checkmark$

$= 135\,000\text{ mm}^2 \checkmark$

Green area = $135\,000\text{ mm}^2 - 92\,214\text{ mm}^2 \checkmark$

$= 42\,786\text{ mm}^2 \checkmark$



Worksheet 3: Volume

1.1 Height: $6\text{ inches} \times 25,4\text{ mm} \checkmark \div 10 \checkmark = 15,24\text{ cm} \checkmark$

Width: $10\text{ inches} \times 25,4\text{ mm} \div 10 = 25,4\text{ cm} \checkmark$

Length: $1\text{ m} \times 100 \checkmark = 100\text{ cm} \checkmark$

1.2 Volume Step 1 = $l \times w \times h$

$= 100\text{ cm} \times 25,4\text{ cm} \times 15,24\text{ cm} \checkmark$

$= 38\,709,6\text{ cm}^3 \checkmark$

$$\text{Volume Step 2} = 100 \text{ cm} \times 25,4 \text{ cm} \times (2 \times \checkmark 15,24 \text{ cm})$$

$$= 77\,419,2 \text{ cm}^3 \checkmark$$

$$\text{Volume Step 3} = 100 \text{ cm} \times 25,4 \text{ cm} \times (3 \times \checkmark 15,4 \text{ cm})$$

$$= 116\,128,8 \text{ cm}^3 \checkmark$$

$$\text{Total volume of steps} = 38\,709,6 \text{ cm}^3 + 77\,419,2 \text{ cm}^3 + 116\,128,8 \text{ cm}^3 \checkmark$$

$$= 232\,257,6 \text{ cm}^3 \checkmark$$

$$1.3 \quad \text{Volume in m}^3 = 232\,257,6 \text{ cm}^3 \div 1\,000\,000 \checkmark = 0,232 \text{ m}^3 \checkmark$$

$$1.4 \quad \text{Volume shallow end} = l \times w \times h$$

$$= (8 \text{ m} \times 100) \text{ cm} \checkmark \times (4,5 \times 100) \text{ cm} \checkmark \times 80 \text{ cm} \checkmark$$

$$= 28\,800\,000 \text{ cm}^3 \checkmark$$

$$1.5 \quad 28\,800\,000 \div 1\,000 \checkmark = 28\,800 \text{ litres} \checkmark$$

$$1.6 \quad \text{Volume deep end} = l \times w \times h$$

$$= 8 \text{ m} \checkmark \times 2 \text{ m} \checkmark \times 3 \text{ m} \checkmark$$

$$= 48 \text{ m}^3 = 48 \text{ kL} \checkmark$$

$$1.7 \quad 48 \text{ kL} \times 1\,000 \checkmark = 48\,000 \text{ litres} \checkmark$$

$$2 \quad \text{Volume of rectangular prism} = l \times w \times h$$

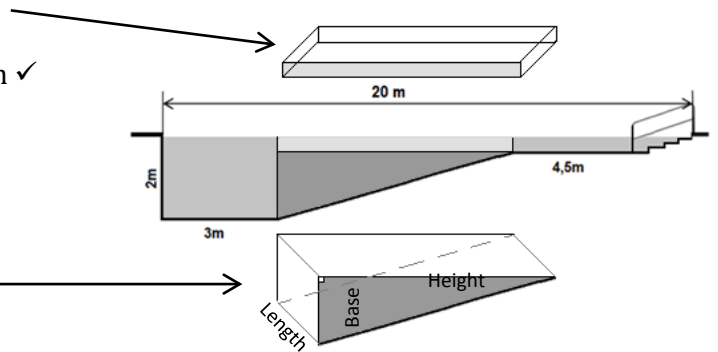
$$= 8 \text{ m} \times (20 \text{ m} - 3 \text{ m} - 4,5 \text{ m} \checkmark) \times 80 \text{ cm}$$

$$= (8 \times 100) \text{ cm} \checkmark \times (12,5 \times 100) \text{ cm} \checkmark \times 80 \text{ cm} \checkmark$$

$$= 800 \text{ cm} \times 1\,250 \text{ cm} \times 80 \text{ cm}$$

$$= 80\,000\,000 \text{ cm}^3$$

$$\therefore 80\,000\,000 \text{ cm}^3 \div 1\,000 \checkmark = 80\,000 \text{ litres} \checkmark$$



Volume of triangular prism

$$= \frac{1}{2} \times b \times h \times \text{length}$$

$$= 0,5 \times (200 \text{ cm} - 80 \text{ cm}) \checkmark \times (2\,000 \text{ cm} - 300 \text{ cm} - 450 \text{ cm}) \checkmark \times 800 \text{ cm} \checkmark$$

$$= 0,5 \times 120 \text{ cm} \times 1\,250 \text{ cm} \times 800 \text{ cm}$$

$$= 60\,000\,000 \text{ cm}^3$$

$$\therefore 60\,000\,000 \text{ cm}^3 \div 1\,000 = 60\,000 \text{ litres} \checkmark$$

$$\text{Total volume sloped section} = 80\,000 \text{ litres} + \checkmark 60\,000 \text{ litres}$$

$$= 140\,000 \text{ litres} \checkmark$$

$$3 \quad \text{Total volume} = V(\text{deep}) + V(\text{shallow}) + V(\text{sloped}) \checkmark$$

$$= 48\,000 \text{ L} + 28\,800 \text{ L} + 140\,000 \text{ L}$$

$$= 216\,800 \text{ L}$$

$$\therefore 216\,800 \text{ L} \div 1\,000 \checkmark = 216,8 \text{ kL} \checkmark$$

4.

LEVEL Kilolitres	USAGE	TARIFF R/kL	CALCULATION ✓	COST	
0-6	6 kL	R0,00	$6 \times R0,00$	R 0,00	
>6-10	$10 - 6 = 4 \text{ kL}$	R7,14	$4 \times R7,14$	R 28,56	✓
>10-15	$15 - 10 = 5 \text{ kL}$	R12,07	$5 \times R12,07$	R 60,35	✓
>15-20	$20 - 15 = 5 \text{ kL}$	R17,65	$5 \times R17,65$	R 88,25	✓
>20-30	$30 - 20 = 10 \text{ kL}$	R26,43	$10 \times R26,43$	R 264,30	✓
>30-40	$40 - 30 = 10 \text{ kL}$	R30,97	$10 \times R30,97$	R 309,70	✓
>40	$216,8 \text{ kL} - 40 = 176,8 \text{ kL} \checkmark$	R41,95	$176,8 \times R41,95$	R 7 416,76	✓
				R 8 167,92	✓

$$5. \quad \text{Volume} = 20 \text{ litres} \checkmark = 20 \times 1\,000 = 20\,000 \text{ cm}^3 \checkmark$$

$$\text{Height} = 289 \text{ mm} \div 10 \checkmark = 28,9 \text{ cm}$$

$$\pi r^2 \times h = \text{volume}$$

$$3,142 \times r^2 \times 28,9 \text{ cm} \checkmark = 20\,000 \text{ cm}^3 \checkmark$$

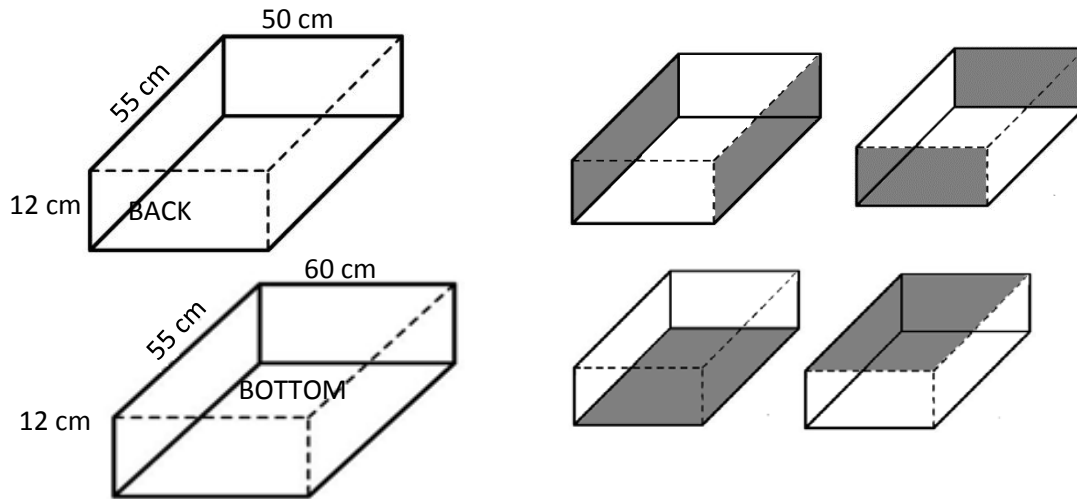
$$90,8038 \times r^2 = 20\,000 \text{ cm}^3$$

$$r^2 = 20\,000 \text{ cm}^3 \div 90,8038 \checkmark$$

$$r = \sqrt{(20\,000 \div 90,8038)} \checkmark \therefore r = 14,841 \text{ cm} \checkmark$$

Worksheet 4: Volume and total surface area

- 1.1 Volume of 2 back cushions = $2(l \times b \times h)$
 $= 2 \times (55 \text{ cm} \times 50 \text{ cm} \times 12 \text{ cm}) \checkmark$
 $= 66\,000 \text{ cm}^3 \checkmark$
 Volume of 2 bottom cushions = $2(l \times b \times h)$
 $= 2 \times (60 \text{ cm} \times 55 \text{ cm} \times 12 \text{ cm}) \checkmark$
 $= 79\,200 \text{ cm}^3 \checkmark$
 Total volume = $66\,000 \text{ cm}^3 + 79\,200 \text{ cm}^3 \checkmark = 145\,200 \text{ cm}^3 \checkmark$



- 1.2 Total surface area back cushions:
 $= \text{Top} + \text{Bottom} + (2 \times \text{long sides}) + (2 \times \text{short sides})$
 $= 2(55 \text{ cm} \times 50 \text{ cm}) \checkmark + 2(55 \text{ cm} \times 12 \text{ cm}) \checkmark + 2(50 \text{ cm} \times 12 \text{ cm}) \checkmark$
 $= 5\,500 \text{ cm}^2 + 1\,320 \text{ cm}^2 + 1\,200 \text{ cm}^2$
 $= 8\,020 \text{ cm}^2$
 Two cushions $\therefore 2 \times \checkmark 8\,020 \text{ cm}^2 = 16\,040 \text{ cm}^2 \checkmark$
- Total surface area bottom cushions:
 $= 2(55 \text{ cm} \times 60 \text{ cm}) \checkmark + 2(55 \text{ cm} \times 12 \text{ cm}) \checkmark + 2(60 \text{ cm} \times 12 \text{ cm}) \checkmark$
 $= 6\,600 \text{ cm}^2 + 1\,320 \text{ cm}^2 + 1\,440 \text{ cm}^2$
 $= 9\,360 \text{ cm}^2$
 Two cushions $\therefore 2 \times 9\,360 \text{ cm}^2 = 18\,720 \text{ cm}^2 \checkmark$
- Total surface area = $16\,040 \text{ cm}^2 + 18\,720 \text{ cm}^2 \checkmark = 34\,760 \text{ cm}^2$
 Answer in $\text{m}^2 = 34\,760 \div 10\,000 \checkmark = 3,476 \text{ m}^2 \checkmark$
 Allow for seam allowances: $3,476 \text{ m}^2 \times \frac{115}{100} \checkmark$
 $= 3,997 \text{ m}^2 \approx 4 \text{ m}^2 \checkmark$

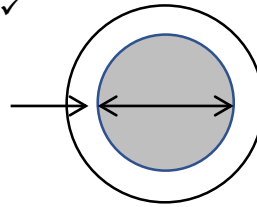
- 2.1 Volume of cylinder = $\pi r^2 \times h \checkmark$
 $= 3,142 \times \left(\frac{25 \text{ cm} \div 2 \checkmark}{100 \checkmark}\right)^2 \times \left(28 \text{ inches} \times \frac{25,4 \text{ mm} \checkmark}{1\,000 \checkmark}\right) \text{ m}$
 $= 3,142 \times 0,015625 \text{ m}^2 \times 0,7112 \text{ m}$
 $= 0,0349 \text{ m}^3 \checkmark$
 15 cushions: $15 \times \checkmark 0,0349 \text{ m}^3 = 0,5235 \text{ m}^3 \checkmark$

- 2.2 Surface area of cylinder
 $= 2 \times \pi r^2 + (2\pi r \times h)$
 $= (2 \times 3,142 \times 0,125^2) \checkmark + (2 \times 3,142 \times 0,125 \times 0,7112) \checkmark$
 $= 0,0981875 + 0,5586476$
 $= 0,6568 \text{ m}^2$
 $\approx 0,657 \text{ m}^2 \checkmark$
 For 15 cushions + extra = $0,657 \text{ m}^2 \times 15 \checkmark \times \frac{115}{100} \checkmark$
 $= 11,333 \text{ m}^2 \checkmark$

3.1 Diameter + $2 \times 8 \text{ cm} \checkmark = 35 \text{ cm} + 16 \text{ cm} = 51 \text{ cm} \checkmark$

$$\begin{aligned}\text{Area (top and bottom)} &= 2 \times \pi r^2 \\ &= 2 \times 3,142 \times \left(\frac{51 \text{ cm}}{2}\right)^2 \checkmark \\ &= 4\,086,171 \text{ cm}^2 \checkmark\end{aligned}$$

Cut 8 cm wider



3.2 Area = $\pi r^2 + 2\pi rh$

$$\begin{aligned}&= 3,142 \times \left(\frac{35}{2}\right)^2 \checkmark + (2 \times 3,142 \times 17,5 \times 65) \checkmark \\ &= 962,2375 \text{ cm}^2 + 7\,148,05 \text{ cm}^2 \\ &= 8\,110,2875 \text{ cm}^2 \\ &= 8\,110,288 \text{ cm}^2 \checkmark\end{aligned}$$

3.3 Volume of cylinder = $\pi r^2 \times h$

$$\begin{aligned}&= 3,142 \times \left(\frac{35}{2}\right)^2 \times 65 \text{ cm} \checkmark \\ &= 62\,545,4375 \text{ cm}^3 \\ &= 62\,545,438 \text{ cm}^3 \checkmark\end{aligned}$$

4.1 The unit is mm. $\checkmark$ A bar fridge is small, typically less than 1 m high. $\checkmark$ Height given as 850 mm would be equal to $850 \div 1\,000 = 0,85 \text{ m} \checkmark$

4.2 Volume = $l \times w \times h$

$$\begin{aligned}&= \frac{850}{10} \times \frac{475}{10} \times \frac{455}{10} \checkmark \checkmark \\ &= 183\,706,25 \text{ cm}^3 \checkmark \\ \text{Volume in litres} &= 183\,706,25 \text{ cm}^3 \div 1\,000 \checkmark = 183,706 \text{ L} \checkmark\end{aligned}$$

This volume is calculated according to the outside dimensions $\checkmark$ of the fridge. A fridge has thick walls for insulation purposes $\checkmark$ and therefore the inside volume will be much less. $\checkmark$ The advertised capacity of 93 L is the inside capacity. $\checkmark$

Exam-type questions: Paper 1

1.1 Non-slip area = $(2 \times 50,03 \text{ m} \times 0,9 \text{ m}) \checkmark + (2 \times 25 \text{ m} \times 0,9 \text{ m}) \checkmark$

$$\begin{aligned}&= 90,054 \text{ m}^2 + 45 \text{ m}^2 \\ &= 135,054 \text{ m}^2 \checkmark\end{aligned}$$

1.2 $135,054 \text{ m}^2 \times 18 \checkmark \div 3,4 \text{ m}^2/\text{L} \checkmark = 714,9917$

$$\approx 715 \text{ litres} \checkmark$$

1.3 $715 \div 20 \checkmark = 35,75 \approx 36 \text{ tins} \checkmark$

1.4 Volume of 2 m-deep pool = $l \times b \times h$

$$\begin{aligned}&= 50,03 \text{ m} \times 25 \text{ m} \times 2 \text{ m} \checkmark \\ &= 2\,501,5 \text{ m}^3 \\ &= 2\,501,5 \text{ kL} (1 \text{ m}^3 = 1 \text{ kL}) \checkmark\end{aligned}$$

$$\begin{aligned}\text{Volume of 3 m-deep pool} &= 50,03 \text{ m} \times 25 \text{ m} \times 3 \text{ m} \checkmark \\ &= 3\,752,25 \text{ m}^3 \\ &= 3\,752,25 \text{ kL} \checkmark\end{aligned}$$

$$\begin{aligned}\text{Difference} &= 3\,752,25 \text{ kL} - 2\,501,5 \text{ kL} \checkmark \\ &= 1\,250,75 \text{ kL} \checkmark\end{aligned}$$

1.5.1 $\frac{10\,560 \checkmark}{3\,752,25 \times 1\,000 \checkmark} \times 100 \checkmark = 0,28\% \checkmark$

1.5.2 $10\,560 \text{ L} \div 100 \text{ L} \checkmark = 105,6 \approx 105 \text{ showers} \checkmark$

(Note: Although the decimal is more than a 5, only 105 full showers can be taken. There is not enough water to take another (the 106th) shower.)

- 2.1 Surface area (cylinder) = $2\pi r^2 + 2\pi rh$
 $= [2 \times 3,142 \times \left(\frac{85}{2}\right)^2] \checkmark + [2 \times 3,142 \times 42,5\text{mm} \times 3\text{mm}] \checkmark$
 $= 11\,350,475\text{ mm}^2 + 801,21\text{ mm}^2$
 $= 12\,151,685\text{ mm}^2$
 $= 12\,151,69\text{ mm}^2 \checkmark$
- 2.2 mg per mm^2 means $\frac{\text{mg}}{\text{mm}^2} = \frac{(6 \times 1\,000)\text{ mg} \checkmark}{12\,151,69\text{ mm}^2 \checkmark} = 0,49375\text{ mg/mm}^2 \approx 0,4938\text{ mg/mm}^2 \checkmark$
- 2.3 $\frac{6\text{ g} \checkmark}{500\text{ g} \checkmark} \times 100 \checkmark = 1,2\% \checkmark$
- 2.4 Volume = $\pi r^2 h$
 $= 3,142 \times 42,5^2 \times 3\text{ mm} \checkmark$
 $= 17\,025,713\text{ mm}^3 \checkmark$
- 3.1 Diameter = $(5,87\text{ m} \times 2 \checkmark) + 3,16\text{ m} \checkmark = 14,9\text{ m} \checkmark$
Radius = $\frac{14,9\text{ m}}{2} \checkmark = 7,45\text{ m} \checkmark$
- 3.2 Two half circles = one full circle $\checkmark$
 $\therefore$ Circumference of circle = $2\pi r = 2 \times 3,142 \times 7,45\text{ m} \checkmark = 46,82\text{ m} \checkmark$
- 3.3 Area of court = $l \times b = 40\text{ m} \times 20\text{ m} \checkmark = 800\text{ m}^2 \checkmark$
- 4.1 $(3,16\text{ m} - \checkmark 3\text{ m}) \div 2 \checkmark = 0,08\text{ m}$
 $0,08\text{ m} \times 1\,000 \checkmark = 80\text{ mm} \checkmark$
- 4.2 Area of back + Area of 2 sides + Area of top
 $= (3,16\text{ m} \times 2,08\text{ m}) \checkmark + (2 \times 2,08\text{ m} \times 1\text{ m}) \checkmark + (3,16\text{ m} \times 1\text{ m}) \checkmark$
 $= 13,89\text{ m}^2 \checkmark$
- 4.3 Perimeter = $2(l + b)$
 $= 2 \times (3,16\text{ m} + [2\text{ m} + 0,08\text{ m} \checkmark]) \checkmark$
 $= 2 \times (3,16\text{ m} + 2,08\text{ m}) \checkmark$
 $= 10,48\text{ m} \checkmark$
- 4.4 Circumference handball ball = $2\pi r = 2 \times 3,142 \times \frac{19}{2} \checkmark = 59,698\text{ cm} \approx 60\text{ cm} \checkmark$
Circumference of soccer ball = $2 \times 3,142 \times \frac{22}{2} \checkmark = 69,124\text{ cm} \approx 69\text{ cm} \checkmark$
Circumference handball : circumference soccer ball
 $60 : 69 \checkmark$
 $1 : 1,15 \checkmark$

Exam-type questions: Paper 2

- 1.1 Area = Area of barn floor + Area of engine room floor
 $= (12\text{ m} \times 8\text{ m}) \checkmark + (2\text{ m} \times 3\text{ m}) \checkmark$
 $= 96\text{ m}^2 + 6\text{ m}^2$
 $= 102\text{ m}^2 \checkmark$
- 1.2 Option 1:
No. of tiles that fit into length = $(12\text{ m} \times 1\,000) \checkmark \div 500\text{ mm} \checkmark = 24\text{ tiles}$
No. of tiles that fit into width = $(8\text{ m} \times 1\,000) \checkmark \div 500\text{ mm} = 16\text{ tiles}$
No. of tiles needed = $24 \checkmark \times 16 \checkmark = 384\text{ tiles}$
Cost = $384 \times \text{R}14,95 \checkmark = \text{R}5\,740,80 \checkmark$

Option 2:

No. of tiles that fit into length = $12\,000\text{ mm} \div 750\text{ mm} \checkmark = 16\text{ tiles}$
No. of tiles that fit into width = $8\,000\text{ mm} \div 400\text{ mm} \checkmark = 20\text{ tiles}$
No. of tiles needed = $16 \checkmark \times 20 \checkmark = 320\text{ tiles}$
No. of boxes needed = $320 \div 10 \checkmark = 32\text{ boxes}$
 $32 \times \$13,45 \checkmark = \$430,40$
 $\therefore \$430,40 \times 14,1453 \checkmark = \text{R}6\,088,137 \approx \text{R}6\,088,14 \checkmark$

Option 1 is the cheapest option. $\checkmark$ / Option 1 costs $(\text{R}6\,088,14 - \text{R}5\,740,80) = \text{R}347,34$ less than Option 2.

2.1. Total area 2 barn doors:

$$3,2808 \text{ feet} = 1 \text{ m}$$

$$1 \text{ foot} = \frac{1}{3,2808}$$

$$12 \text{ feet} = \frac{12}{3,2808} \checkmark$$

$$\text{Length of door} = \frac{12}{3,2808} \text{ m} + \checkmark \left[\left(8 + \frac{3}{4} \checkmark \right) \times 25,4 \text{ mm} \div 1\,000 \checkmark \right] \text{ m}$$

$$= 3,8798 \text{ m}$$

$$\approx 3,880 \text{ m} \checkmark$$

$$\text{Area of 2 doors} = 2 (l \times b)$$

$$= 2 \times (3,880 \text{ m} \times 2,5 \text{ m}) \checkmark$$

$$= 2 \times 9,7 \text{ m}^2$$

$$= 19,4 \text{ m}^2 \checkmark$$

2.2 Total area of windows = $7(l \times b) \checkmark = 7 \times (1,2 \text{ m} \times 0,6 \text{ m}) \checkmark = 5,04 \text{ m}^2 \checkmark$

2.3 Area of back wall = Area of rectangle + Area of triangle

$$= (l \times b) + \left(\frac{1}{2} b \times h \right) \checkmark$$

$$= (8 \text{ m} \times 5 \text{ m}) \checkmark + \left(\frac{1}{2} \times 8 \text{ m} \times \frac{1\,100 \text{ mm}}{1\,000} \checkmark \right) \checkmark$$

$$= 44,4 \text{ m}^2 \checkmark$$

2.4 Total area of walls =

$$[\text{Area of 2 side walls} + \text{back wall} + \text{front wall}] - [\text{Area of windows} + \text{area of doors}]$$

$$= [2(12 \text{ m} \times 5 \text{ m}) \checkmark + 2(44,4 \text{ m}^2) \checkmark] - \checkmark [19,4 \text{ m}^2 + 5,04 \text{ m}^2] \checkmark$$

$$= [120 \text{ m}^2 + 99,8 \text{ m}^2] - [24,44 \text{ m}^2]$$

$$= 184,36 \text{ m}^2 \checkmark$$

2.5 Area to paint = $184,36 \text{ m}^2 \times 2 \checkmark = 368,72 \text{ m}^2$

$$\text{Paint needed (litres)} = 368,72 \text{ m}^2 \div 8 \text{ m}^2/\text{litre} \checkmark = 46,09 \text{ L} \approx 47 \text{ L} \checkmark$$

$$\text{Tins of paint needed} = 47 \text{ L} \div 15 \text{ L} \checkmark = 3,1 \text{ tins} \approx 4 \text{ tins} \checkmark$$

$$\text{Cost} = 4 \times \text{R}1\,508,95 \checkmark = \text{R}6\,035,80 \checkmark$$

3.1 Length of roof = $12 \text{ m} \checkmark + \left(2 \times \frac{30}{100} \checkmark \right) \checkmark$

$$= 12 \text{ m} + 0,6 \text{ m}$$

$$= 12,6 \text{ m} \checkmark$$

Width of hypotenuse of roof:

$$c^2 = a^2 + b^2$$

$$= \left(\frac{1\,100}{1\,000} \checkmark \right)^2 + \left(\frac{8}{2} + 0,3 \checkmark \right)^2 \checkmark$$

$$c = \sqrt{(1,1)^2 + (4,3)^2} \checkmark$$

$$= 4,4385 \text{ m}$$

$$= 4,438 \text{ m} \checkmark$$

$$2 \times \text{Area of roof (both sides)} \checkmark = 2 \times (12,6 \text{ m} \times 4,438 \text{ m}) \checkmark$$

$$= 111,8494 \text{ m}^2$$

$$= 111,849 \text{ m}^2 \checkmark$$

3.2.1 Volume = $\pi r^2 h$

$$= 3,142 \times \left(\frac{2 \text{ cm}}{2} \checkmark \right)^2 \times \left(\frac{120}{10} \checkmark \right) \text{ cm} \checkmark$$

$$= 3,142 \times 1^2 \times 12 \text{ cm}$$

$$= 37,704 \text{ cm}^3 \checkmark$$

$$= 37,704 \text{ mL} (1 \text{ cm}^3 = 1 \text{ mL}) \checkmark$$

$$\begin{aligned}
3.2.2 \text{ Volume rain runoff (L)} &= [\text{Max monthly rainfall(cm)} \times \text{roof area(cm}^2) \times 90\%] \div 1\,000 \\
&= (120 \text{ mm} \div 10 \checkmark) \text{ cm} \times (111,849 \times 10\,000 \checkmark) \text{ cm}^2 \times \frac{90}{100} \checkmark] \div 1\,000 \\
&= [12 \text{ cm} \times 1\,118\,490 \text{ cm}^2 \times 0,9] \div 1\,000 \\
&= 12\,079,69 \text{ L} \\
&\therefore 12\,079,69 \text{ L} \div 1\,000 = 12,0897 \approx 12,08 \text{ kL} \checkmark
\end{aligned}$$

$$\begin{aligned}
3.2.3 \text{ Volume of tank} &= \pi r^2 h \\
&= 3,142 \times \left(\frac{900 \text{ mm} \div 1\,000 \checkmark}{2 \checkmark} \right)^2 \times 2,4 \text{ m} \checkmark \\
&= 3,142 \times 0,2025 \text{ m}^2 \times 2,4 \text{ m} \\
&= 1,527 \text{ m}^3 \checkmark \\
&= 1,527 \text{ kL} (1 \text{ m}^3 = 1 \text{ kL}) \checkmark \\
&\text{No, } \checkmark \text{ the tank is not big enough to hold the maximum rain run-off } (1,527 \text{ kL} < 12,08 \text{ kL}) \checkmark
\end{aligned}$$

Topic 3 Financial documents ANSWERS

Worksheet 1: Budget statements

1. Invest money to receive interest ✓✓ Invest in marketing to help increase sales. ✓✓
2. $\frac{47\,000 - 40\,000}{40\,000} \times \frac{100}{1} \checkmark \checkmark = 17,5\% \checkmark$
3. The income increased. ✓✓
4. Marketing ✓; R8 000 ✓
5. Increase awareness of the business and the products they are selling. ✓✓
6. Marketing will increase sales ✓ which will increase income. ✓
7. $R47\,000 \times \frac{33,75}{100} \checkmark = 15\,862,50 \checkmark$; $47\,000 + 15\,862,50 \checkmark = R62\,862,50 \checkmark$
8. Total income: $62\,862,50 + 2\,750 \checkmark \checkmark = R65\,612,50 \checkmark$
9. $\frac{5\,800}{1} \times \frac{10}{100} \checkmark \checkmark = 580 \checkmark$ The indicated increase is more than R580, which is the 10% increase according to the contract. ✓✓
10. If actual performance is as budgeted, then Fundi General Store would be wise to keep on spending on marketing. ✓✓
Income increases by more than the spending on marketing. ✓✓
11. $17\,891,00 + 900,00 \checkmark + 1\,550 \checkmark + 16\,700,00 + 17\,000,00 + \frac{8\,000}{2} \checkmark$
 $= R58\,041,00 \checkmark$
12. Surplus. ✓ $R65\,612,50 - R58\,041,00 = R7\,571,50 \checkmark \checkmark$

Worksheet 2: Income and expenditure statements

1. These are the actual amounts that were received as income and paid as expenditures. ✓✓
2. The budget consists of estimated values. ✓✓ Income and expenditure statement shows real values. ✓✓
3. No ✓✓, the amount for sales will change from month to month. ✓✓
4. A surplus. ✓✓ $41\,103 - 41\,025 = R78 \checkmark \checkmark$
5. Decrease expenditures like travel and telephone. ✓✓
Increase income with investments and increase in sales. ✓✓
6. The surplus will decrease or be turned into shortage. ✓✓

Worksheet 3: Quotations

1. 107 ✓✓
2. 35 days ✓✓
3. $14,90 - 14,55 \checkmark = R0,35 \checkmark$
4. $\frac{33,75 - 31,75}{31,75} \times \frac{100}{1} \checkmark \checkmark = 6,3\% \checkmark$
5. Canned Tuna: R9,99 ✓✓
Bar of soap: R6,95 ✓✓
- 6.1 These items are exempted from VAT. ✓✓
- 6.2 All fruit, all vegetables, milk, flour, bread (any 3 acceptable answers) ✓✓✓
7. No ✓ (VAT-free items prices were also included)
 $(219,00 + 69,93 + 952,50 + 173,75 + 194,25 + 239,40) \checkmark \checkmark \times 15\% \checkmark = R277,32 \checkmark$
8. Total for Abongile = $2\,136,58 + 277,32 \checkmark = R2\,413,90 \checkmark$
Thus, Abongile Wholesaler will be cheaper. ✓
9. Buy the cheapest goods of each supplier. ✓✓
10. Competition is good for business. More opportunity to shop for the cheapest goods. ✓✓

Worksheet 4: Invoices

1. The business that is rendering a service or producing or selling items. ✓✓
2. When items are provided, and the account needs to be settled. ✓✓
3. Patel-Marketing issued the invoice to Fundi General Store. ✓✓
4. 29/7/2018 ✓✓
5. The person receiving the items at Fundi General Store. ✓✓
6. For designing and printing marketing material. ✓✓

- 7.1 $R393,75 \div R3,15 \checkmark = 125 \text{ flyers} \checkmark$
- 7.2 $R312,50 \div 2,5 \checkmark = R125,00 \checkmark$
- 7.3 $1\,250 \times 0,5 \checkmark = R625,00 \checkmark$
- 7.4 $393,75 + 312,50 + 625,00 + 4\,500,00 \checkmark \checkmark = R5\,831,25 \checkmark$
- 7.5 $5\,831,25 \times 15 \div 100 \checkmark \checkmark = R874,69 \checkmark$
- 7.6 $5\,831,25 + 874,69 \checkmark \checkmark = R6\,705,94 \checkmark$
8. $2,5 \text{ hours} + 12 \text{ hours} = 14,5 \text{ hours or } 14 \text{ hours and } 30 \text{ minutes.} \checkmark \checkmark$
9. $312,50 + 4\,500,00 \checkmark = R4\,812,50 \checkmark$
 $\frac{4\,812,50}{5\,831,25} \times \frac{100}{1} \checkmark = 82,53\% \checkmark$
10. Flyer is small printed page, A4 or A5 size and newspaper advert is bigger and will be printed in large volumes. The newspaper will reach more people, be more widespread than a flyer drop. The newspaper will have guidelines around size, style etc. Need to design carefully to make full use of reaching the newspaper's audience. $\checkmark \checkmark$
11. Mat312 should be under Item code. Flyers should be under Description. $\checkmark \checkmark \checkmark$
 The wrong person signed the invoice. The representative from Fundi General Store must sign the invoice. $\checkmark \checkmark$

Worksheet 5: Salary slips

1. Sally Meyer $\checkmark \checkmark$
2. Hopedale $\checkmark \checkmark$
3. September $\checkmark \checkmark$
4. A salary needs to be deposited into bank account. Bank name and account number on salary slip: Rose Bank. $\checkmark \checkmark$
5. $11\,200 \times 13 \checkmark \checkmark = R145\,600 \checkmark \checkmark$
6. $11\,200 \times 7,8\% \checkmark = R873,60 \checkmark$
 $11\,200 + 873,60 \checkmark = R12\,073,60 \checkmark$
7. $12\,073,60 \checkmark \times 6,1875 \div 100 \checkmark = R747,05 \checkmark \checkmark$
8. $12\,073,60 \checkmark \times 1\% \checkmark \checkmark = R120,74 \checkmark$
9. $693,00 + 45,00 + 1\,346,00 + 112,00 \checkmark \checkmark \checkmark = R2\,196,00 \checkmark$
10. The net salary of R9 004,00 $\checkmark \checkmark$
11. $\frac{2\,196,00}{11\,200,00} \times \frac{100}{1} \checkmark \checkmark = 19,61\% \checkmark$
12. Keep their salaries up to date with inflation. Keep employees motivated. (or any reasonable answer) $\checkmark \checkmark$

Worksheet 6: UIF

- 1.1 $12\,100,00 \times 1\% \checkmark = R121,00 \checkmark$
- 1.2 $14\,137,50 \times 1\% \checkmark = R141,38 \checkmark$
- 2.1 $121,00 \times 2 \checkmark = R242,00 \checkmark$
- 2.2 $141,38 \times 2 \checkmark = R282,76 \checkmark$
- 3.1 $(5 \times 365) \div 6 \checkmark = 304,17 \checkmark$ Reduced to maximum of 238 days $\checkmark$
- 3.2 $(3,5 \times 365) \div 6 \checkmark = 212,92 \approx 213 \text{ days} \checkmark \checkmark$
- 4.1 $29,2 + \frac{99\,779,68}{3\,239,6+12\,100} \checkmark \checkmark = 35,70\% \checkmark$
- 4.2 $29,2 + \frac{99\,779,68}{3\,239,6+14\,137,50} \checkmark \checkmark = 34,94\% \checkmark$
- 5.1 $12\,100,00 \times 35,70\% \checkmark = R4\,319,70 \checkmark$
- 5.2 $14\,137,50 \times 34,94\% \checkmark = R4\,939,64 \checkmark$
- 6.1 $(4\,319,70 \times 12) \div 365 \checkmark = R142,02 \checkmark$
- 6.2 $(4\,939,64 \times 12) \div 365 \checkmark = R162,40 \checkmark$
- 7.1 $238 \times 142,02 \checkmark \checkmark = R33\,800,76 \checkmark$
- 7.2 $212,92 \times 162,40 \checkmark \checkmark = R34\,578,21 \checkmark$

- 8.1 $33\,800,76 \div 4\,319,70 = 7,82 \checkmark$
 Thus: 7 months at R4 319,70 $\checkmark$ + month 8 at R3 562,86 $\checkmark$
 $[33\,800,76 - (7 \times 4\,319,70)] = R3\,562,86$
- 8.2 $34\,578,21 \div 4\,939,64 = 7 \checkmark$
 Thus: 7 months at R4 939,64 $\checkmark$ + month 8 at R0,73 $\checkmark$
 $[34\,578,21 - (7 \times 4\,939,64)] = R0,73$

Worksheet 7: Income replacement rate

1. $(10 \times 365) \div 6 = 608,33 \checkmark = 238 \text{ days } \checkmark \checkmark$
2. $(4 \times 365) \div 6 = 243,33 \checkmark = 238 \text{ days } \checkmark \checkmark$
3. $IRR = 29,2 + \frac{99\,779,68}{3\,239,6+12\,549} \checkmark \checkmark = 35,52\% \checkmark$
4. $12\,549,00 \times 35,52\% \checkmark = (4\,457,40 \times 12) \div 365 \checkmark = R146,54 \checkmark$
5. $22\,325,00 \times 33,10\% \checkmark = (7\,389,58 \times 12) \div 365 \checkmark = R242,95 \checkmark$
6. $3\,147,00 \times 44,82\% \checkmark = (1\,410,49 \times 12) \div 365 \checkmark = R46,37 \checkmark$
7. $242,95 \times 60,83 \checkmark \checkmark = R14\,778,65 \checkmark$
8. $46,37 \times 238 \checkmark \checkmark = R11\,036,06 \checkmark$

Worksheet 8: Inflation

- 1.1 $799,99 \times 7,9\% \checkmark = R63,20 \checkmark$
 $799,99 + 63,20 \checkmark = R863,19 \checkmark$
- 1.2 $\frac{8\,249,95-7\,941,95}{7\,941,95} \times \frac{100}{1} \checkmark \checkmark = 3,88\% \checkmark \checkmark$
- 1.3 $1\,106,50 \times 100/110,5 \checkmark \checkmark = R1\,001,36 \checkmark \checkmark$
- 2.1 $550 \times 6,68 \div 100 \checkmark = 36,74 \checkmark$
 $550 + 36,74 \checkmark = 586,74 \checkmark$
 $586,74 - 276,50 = R310,24 \checkmark$
- 2.2 $\frac{550-425}{425} \times \frac{100}{1} \checkmark \checkmark = 29,41\% \checkmark$
- 3.1 $\frac{12,95-13,55}{13,55} \times \frac{100}{1} \checkmark \checkmark = -4,43\% \checkmark \checkmark$
- 3.2 $\frac{13,99-13,55}{13,55} \times \frac{100}{1} \checkmark \checkmark = 3,25\% \checkmark \checkmark$
- 3.3 $\frac{13,99-12,95}{12,95} \times \frac{100}{1} \checkmark \checkmark = 8,03\% \checkmark \checkmark$
- 3.4 Inflation rate decreased from April to May but increased again from May to June. $\checkmark \checkmark$

Exam-type questions: Paper 1

- 1.1 No. $\checkmark$ Income from sales differ as the market changes from month to month. $\checkmark \checkmark$
- 1.2 Depending on the contract, usually only once. $\checkmark \checkmark$
- 1.3 Tax needs to be paid to SARS and is calculated as part of income. $\checkmark \checkmark$
 The tax that is deducted from employee's salaries need to be paid to SARS. $\checkmark \checkmark$
- 1.4.1 Sales $\checkmark \checkmark$
- 1.4.2 Municipal account $\checkmark \checkmark$, Cost of sales $\checkmark \checkmark$, Tax $\checkmark \checkmark$
- 1.5 Yes. $\checkmark$ Salary will increase because of the extra payment that is done. $\checkmark$ The tax will increase because of increase in salary. $\checkmark$ This will cause a decrease in the surplus. $\checkmark$
- 1.6 Increase sales or decrease expenditure. $\checkmark \checkmark$
- 1.7 Repair work, Installation of equipment, any expenditure that does not occur every month. $\checkmark \checkmark \checkmark \checkmark$
- 1.8 No. $\checkmark \checkmark$ The budget is only an estimate and planning for the month. $\checkmark \checkmark$
- 1.9 No. $\checkmark \checkmark$ All values depend on the sales of the month which is influenced by the market. $\checkmark \checkmark$
- 2.1 $245,39 + 36,81 = R282,20 \checkmark \checkmark$
- 2.2 $1\,164,23 - 151,86 \checkmark = R1\,012,37 \checkmark \checkmark$
- 2.3 $645,41 - 561,23 = R84,18 \checkmark \checkmark$
- 2.4 $12\,157,93 \times 15\% \checkmark = R1\,823,69 \checkmark$
- 2.5 $12\,157,93 + 1\,823,69 \checkmark = R13\,981,62 \checkmark$

- 2.6 $5\,678,25 \times 15 \div 115 \checkmark = R740,64 \checkmark$
 2.7 $5\,678,25 - 740,64 \checkmark = R4\,937,61 \checkmark$
- 3.1.1 $142,35 \div 10,95 \checkmark = 13 \checkmark$
 3.1.2 $86,45 \div 7 \checkmark = R12,35 \checkmark$
 3.1.3 $15 \times 14,95 \checkmark = R224,25 \checkmark$
 3.1.4 $209,30 + 119,40 + 142,30 + 86,45 + 485,75 + 448,50 + 224,25 + 417,00 \checkmark$
 $= R2\,133,00 \checkmark$
 3.1.5 $2\,133,00 + 270,65 \checkmark = R2\,403,65 \checkmark$
 3.2 These items are VAT exempt, VAT is not charged on them. $\checkmark$ The South African Revenue Services (SARS) determines which items are exempt from VAT. $\checkmark$
 3.3 30 days from 31 October 2018 $\checkmark = 30$ November 2018 $\checkmark\checkmark$
 3.4 A new quotation will be needed to get the latest costs. $\checkmark\checkmark$
 3.5 Fundi General Store could use the quote number (86 173) $\checkmark$ or their name $\checkmark$ as reference in the EFT payment. $\checkmark$
- 4.1 Uniondale $\checkmark\checkmark$
 4.2 Help with marketing for Fundi General Store. $\checkmark\checkmark$
 4.3 Fundi General Store would use it to claim VAT at the end of each month. $\checkmark\checkmark$
 4.4 AC-Bank $\checkmark\checkmark$
 4.5 It is used as short link to the product. $\checkmark\checkmark$
 The code can be used in different documents but have same meaning. $\checkmark\checkmark$
 4.6 $7\,255,50 \times 15 \div 100 \checkmark\checkmark = R1\,088,33 \checkmark$
- 5.1 $21\,239,00 \times 1\% \checkmark = R212,39 \checkmark$
 5.2 $212,39 \times 2 \checkmark = R424,78 \checkmark$
 5.3 $(2 \times 365) \div 6 \checkmark = 121,67$ days $\checkmark\checkmark$
 5.4 $29,2 + \frac{99\,779,68}{3\,239,6 + 21\,239,00} \checkmark\checkmark = 33,28\% \checkmark$
 5.5 $21\,239,00 \times 33,28\% \checkmark = R7\,068,34 \checkmark$
 5.6 $(7\,068,34 \times 12) \div 365 \checkmark = R232,38 \checkmark$
 5.7 $121,67 \times 232,38 \checkmark\checkmark = R28\,273,67 \checkmark$
 5.8 $28\,273,67 \div 7\,068,34 = 4 \checkmark$
 Thus: 4 months at R7 068,64 $\checkmark$ + month 5 at R0,31 $\checkmark$
 $[28\,273,67 - (7\,068,34 \times 4)] = R0,31$

Exam-type questions: Paper 2

- 1.1.1 $14 \times 1,5 \times 34,95 \checkmark\checkmark = R733,95 \checkmark$
 1.1.2 $733,95 + 191,40 + 109,50 + 525,00 + 21,75 + 524,25 + 194,25 + 117,00 \checkmark\checkmark$
 $= R2\,417,10 \checkmark$
 1.1.3 $2\,417,10 - 191,40 - 525,00 \checkmark = R1\,700,70 \checkmark$
 $1\,700,70 \times 15/100 \checkmark = R255,11 \checkmark$
 1.1.4 $2\,417,10 + 255,11 \checkmark\checkmark = R2\,672,21 \checkmark$
 1.2 17 January 2019 $\checkmark\checkmark$
 1.3 No $\checkmark\checkmark$ The quoted prices were only valid for 30 days, until 31 December. $\checkmark\checkmark$
 1.4 $\frac{37,95 - 34,95}{34,95} \times \frac{100}{1} \checkmark\checkmark = 8,58\% \checkmark$
 No. $\checkmark$ Chicken increased by 8,58% and inflation was only 6,8% $\checkmark\checkmark$
 1.5 $\frac{37,33 - 34,95}{34,95} \times \frac{100}{1} \checkmark\checkmark = 6,81\% \checkmark$ Yes $\checkmark$
 1.6 Invoice item SG2467 500 g sugar should be $10 \times 10,95 = R109,50 \checkmark$
 Total changes to: R2 515,80 $\checkmark$
 VAT has been calculated without taking VAT exempt items into account. It should be
 $1\,799,40 \times 15/100 = R269,91 \checkmark$
 Invoice total (incl. VAT) should be R2 785,71 $\checkmark$
 1.7 Buy items before the quotation's date expires. $\checkmark\checkmark$
- 2.1 $11\,230,00 \times 7,2\% \checkmark = R808,56 \checkmark$
 $11\,230,00 + 808,56 \checkmark = R12\,038,56 \checkmark$
 2.2 $11\,230,00 \times 6,8\% \checkmark = R763,64 \checkmark$
 $808,56 - 763,64 \checkmark\checkmark = R44,92 \checkmark$

- 2.3 $12\,038,56 \times 1\% \checkmark\checkmark = R120,39 \checkmark$
- 2.4 $120,39 \times 2 \checkmark = R240,78 \checkmark$
 $240,78 \times 12 \checkmark = R2\,889,36 \checkmark$
- 2.5 $1\,203,86 + 45,00 + 2\,166,94 + 120,39 \checkmark\checkmark = R3\,536,19 \checkmark$
- 2.6 $12\,038,56 - 3\,536,19 \checkmark\checkmark = R8\,502,37 \checkmark$
- 2.7 $29,2 + \frac{99779,68}{3\,239,6 + 12\,038,56} \checkmark = 35,73\% \checkmark$
 $12\,038,56 \times 35,73\% \checkmark = R4\,301,38 \checkmark$
 $(4\,301,38 \times 12) \div 365 \checkmark = R141,42 \checkmark$
 $141,42 \times 126,67 \checkmark = R17\,913,67 \checkmark$

Topic 4 Banking ANSWERS

Worksheet 1: Working with bank statements

- 1.1 $3\,465 - 750 \checkmark = R\,2\,715,00 \checkmark\checkmark$
- 1.2 $8\,336 - 401 \checkmark = R\,7\,935,00 \checkmark\checkmark$
- 1.3 $3\,817 - 3\,693,50 \checkmark = R\,123,50 \checkmark\checkmark$
- 1.4 2018/07/09 $\checkmark\checkmark$

2. R3 465,00 $\checkmark\checkmark$
3. All payments $\checkmark\checkmark$
4. The payment is deducted from, $\checkmark\checkmark$ or the amount received is added to, $\checkmark\checkmark$ the previous balance. $\checkmark\checkmark$
5. It is the closing balance of the previous month. $\checkmark\checkmark$
6. It is a record of all transactions to and from a bank account. $\checkmark\checkmark$
7. That is the amount of money in the bank account $\checkmark$ at the end of the month. $\checkmark\checkmark$
8. 10 July 2018 $\checkmark\checkmark$
9. Hopedale $\checkmark\checkmark$
10. Yes. $\checkmark$ There is enough money left at the end of a month to afford a cell phone contract. $\checkmark\checkmark$
11. 2018/07/30 Payment Car loan R1 240,00 $\checkmark\checkmark$
12. R3 693,50 $\checkmark\checkmark$
13. 30 June 2018 $\checkmark\checkmark$
14. It is the end of the month and payments are done on the end of a month. $\checkmark\checkmark$
15. Some end of month dates are on weekends and payment will only be done on the first working day after the weekend. $\checkmark\checkmark$

Worksheet 2: Balances

- 1.1 12 August 2018 $\checkmark\checkmark\checkmark$
- 1.2 10/07/2018 $\checkmark\checkmark$
- 1.3 R3 693,50 $\checkmark\checkmark\checkmark$
- 1.4 $-3\,983 \checkmark - 879 \checkmark = -R\,4\,862,00 \checkmark$
- 1.5 11/08/2018 $\checkmark\checkmark$
- 1.6 Closing balance $\checkmark\checkmark$
- 1.7 -R1 689,50 $\checkmark\checkmark\checkmark$

2. 22 days of July + 11 days of August $\checkmark\checkmark = 33$ days $\checkmark$
3. The only income received during that time was the salary. $\checkmark\checkmark$
4. She borrowed money. $\checkmark$ The statement shows a minus in front of the amount that shows that she has taken more money from the account than she had in the account. $\checkmark\checkmark$
5. Overdraft is an arrangement with the bank that the account holder may withdraw more money than the amount that she has put into the account. $\checkmark\checkmark$ The balance of -R1 689,50 shows that she needs to pay R1 689,50 back to the bank. $\checkmark\checkmark$

Worksheet 3: Current accounts

1. No. $\checkmark$ Students and the elderly have a lower bank charge or no fee at all. $\checkmark\checkmark$ Banks have a few different options, for example, Rose Bank has three current account options. $\checkmark$ The fees are specific to the type of account and based on the individual account holder. $\checkmark$
2. Current account, $\checkmark$ Gold Current account, $\checkmark$ Flexi Current account $\checkmark$
3. The higher the overdraft allowed on the current account, the higher the monthly fee for using the facility. $\checkmark$ A client may choose to pay a higher fee to have access to a higher overdraft. $\checkmark$
4. R18,50 $\checkmark\checkmark$
5. $20,00 \checkmark + 2,50 \times (3\,500 \div 100) \checkmark\checkmark = R\,107,50 \checkmark\checkmark$
6. $1,95 \times (2\,500 \div 100) \checkmark\checkmark = 48,75 \checkmark \times 20 \checkmark = R\,975,00 \checkmark\checkmark$
7. It is very expensive to issue a cheque at R37 per cheque. $\checkmark\checkmark$

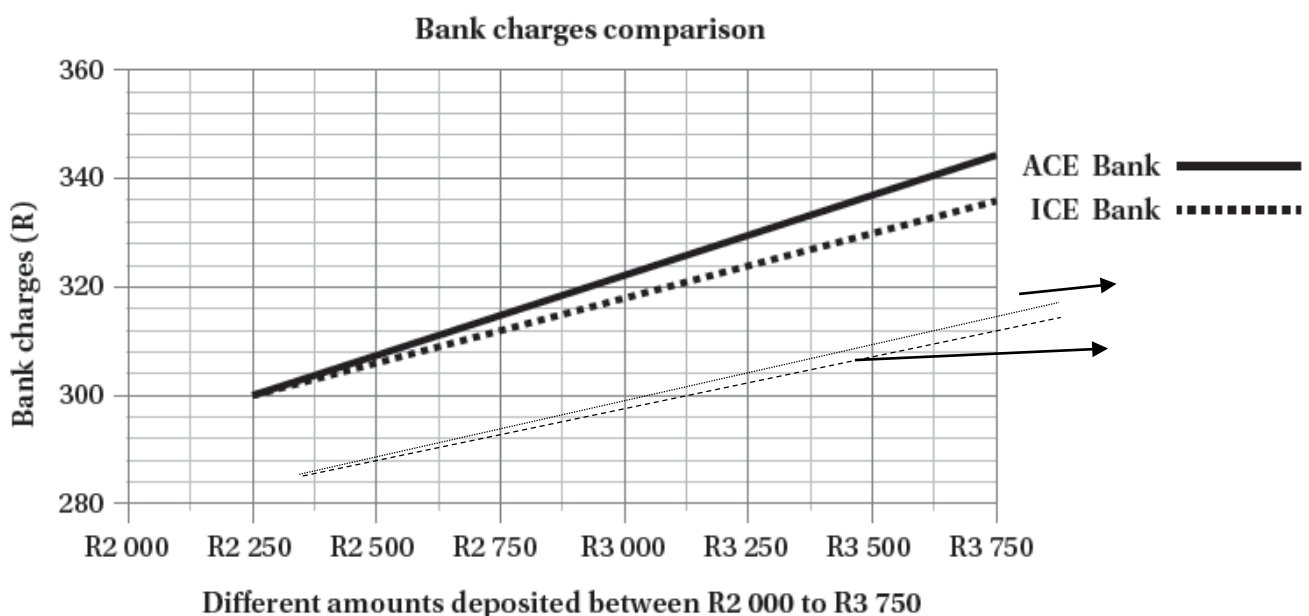
Worksheet 4: Bank charges

1. There are no costs. $\checkmark\checkmark$
2. They earn no money to pay a fee. $\checkmark\checkmark$

3. No cheque payments ✓✓
No overdraft facilities ✓✓
4. Cash withdraws at other bank branch ✓✓
Cash withdraws at other bank ATM ✓✓ Other valid options.
5. Forcing students to withdraw money at their bank and save costs. ✓✓
6. Cheque deposit at the branch ✓✓
Cash withdraws at the ATM ✓✓
7. $3,95 + 1,35 \times (950 \div 100)$ ✓
 $= 3,95 + (1,35 \times 9,5) \approx 3,95 + (1,35 \times 10)$ ✓
 $= 17,45$ ✓ $\therefore$ The student cost will be cheaper than the R22,45 of the current account holder. ✓
8. $\frac{13,00-11,50}{11,50} \times \frac{100}{1}$ ✓✓ = 13,04% ✓
9. $1,95 \times (500 \div 100)$ ✓ = $1,95 \times 5 = R9,75 \times 5$ ✓ = R48,75 ✓
10. Students do not have the financial means to afford or handle the responsibility of these services. ✓✓

Worksheet 5: Working with bank charges

1. ACE Bank ✓✓
2. $\frac{69-57}{57} \times \frac{100}{1}$ ✓✓ = 21,05% ✓✓
3. $6,45 + 2,15(999 \div 100)$ ✓✓ = $6,45 + 2,15(10)$ ✓ = R27,95 ✓
4. $6,95 + 2,25(1\ 201 \div 100)$ ✓✓ = $6,95 + 2,25(13)$ ✓ = R36,20 ✓
- 5.1 $69 + 179 + 6,95 + [2,25 \times (2\ 250 \div 100)]$ ✓✓
 $= 69 + 179 + 6,95 + [2,25 \times 22,5 \approx 23]$ ✓
 $= R306,70$ ✓
- 5.2 $57 + 192 + 6,45 + [2,15 \times (2\ 750 \div 100)]$ ✓✓
 $= 57 + 192 + 6,45 + [2,15 \times 27,5 \approx 28]$ ✓
 $= R315,65$ ✓
- 5.3 $69 + 179 + 6,95 + [2,25 \times (3\ 250 \div 100)]$ ✓✓
 $= 69 + 179 + 6,95 + [2,25 \times 32,5 \approx 33]$ ✓
 $= R329,20$ ✓
- 5.4 $57 + 192 + 6,45 + [2,15 \times (3\ 250 \div 100)]$ ✓✓
 $= 57 + 192 + 6,45 + [2,15 \times 32,5 \approx 33]$ ✓
 $= R326,40$ ✓
- 5.5 $57 + 192 + 6,45 + [2,15 \times (3\ 500 \div 100)]$ ✓✓
 $= 57 + 192 + 6,45 + [2,15 \times 35]$ ✓
 $= R330,70$ ✓
- 6.



ACE Bank ✓✓ R331,95 ✓✓ R373,08 ✓✓ any other point on the graph ✓ ICE Bank ✓✓
 R321,45 ✓✓ R379,20 ✓✓ any other point on the graph ✓ connecting the data points ✓

7. No. ✓ ICE Bank's bank charges are cheaper for any deposit. ✓✓
 8. ICE Bank ✓
 ACE Bank = $179 + 69 + 6,95 + (2,25 \times 40) = R344,95$ ✓
 ICE Bank = $192 + 57 + 6,45 + (2,15 \times 40) = R341,45$ ✓

Worksheet 6: Transactions

- 1.1 $\frac{37,8-34,5}{34,5} \times \frac{100}{1} \checkmark\checkmark = 9,57\%$ ✓✓
 1.2 $189\,999 \times 15\% \checkmark\checkmark = R28\,499,85$ ✓
 1.3 $\frac{17\,499,90}{174\,999} \times \frac{100}{1} \checkmark\checkmark = 10\%$ ✓✓
 1.4 $189\,999 - 28\,499,85 \checkmark\checkmark = 161\,510,15$ ✓
 $161\,510,15 \times 12\% \times 6 \checkmark\checkmark = R116\,287,31$ ✓
 1.5 $161,510,15 + 116\,287,31 \checkmark = 277\,797,46$ ✓
 $\frac{277\,797,46}{6 \times 12} \checkmark\checkmark = R3\,858,30$ ✓
 1.6 $174\,999 - 17\,499,90 \checkmark = 157\,499,10$ ✓
 $157\,499,10 \times 15,75\% \times 3 \checkmark = R74\,418,32$ ✓
 It would be less. ✓
 1.7 Desmerc = $277\,797,46 + 28\,499,85 \checkmark\checkmark = R306\,297,31$ ✓
 Lovovo = $157\,499,10 + 74\,418,32 + 17\,499,90 \checkmark\checkmark\checkmark = R249\,417,32$ ✓
 Lovovo is the cheaper option. ✓
 2.1 $15\,449,00 \times 12,5\% \checkmark\checkmark = R1\,931,13$ ✓✓
 2.2 $\frac{8\,110,72}{6} \checkmark\checkmark = R1\,351,79$ ✓
 2.3 $\frac{23\,559,72 - 1\,931,13}{72} \checkmark\checkmark = R327,22$ ✓
 2.4 $14\,999 \times 5\% \checkmark\checkmark = R749,95$ ✓
 2.5 $550 \times (3 \times 12) \checkmark\checkmark = R19\,800,00$ ✓✓
 2.6 Dries computers = $R23\,559,72$ ✓✓
 Orange computers = $749,95 + 19\,800 \checkmark\checkmark = R20\,549,95$ ✓✓
 Orange computers will be cheaper ✓✓

Worksheet 7: Investments

- 1.1.1 $125\,000 \times 5,5\% \times 1 = 6\,875$ ✓
 $125\,000 + 6\,875 \checkmark = R131\,875,00$ ✓
 1.1.2 $154\,853,09 \times 5,5\% \times 1 = 8\,516,92$ ✓
 $154\,853,09 + 8\,516,92 \checkmark = R163\,370,01$ ✓
 1.1.3 $163\,370,01 - 125\,000 \checkmark\checkmark = R38\,370,01$ ✓
 1.2 5 years ✓✓
 1.3 $146\,780,18 - 139\,128,13 \checkmark = R7\,652,05$ ✓
 1.4 $154\,853,09 - 146\,780,18 \checkmark = R8\,072,91$ ✓
 1.5 Yes. ✓ Interest is calculated on the total of the previous year. This amount includes investment amount and interest of previous years. ✓✓
 1.6 Yes. ✓ In general, banks state that the investment may be increased, but money if money is taken from the account, they may penalise the account holder by increasing the interest rate. ✓
 2.1 $164\,462,97 - 125\,000 \checkmark = R39\,462,97$ ✓
 2.2 $R164\,462,97$ ✓
 2.3 In the first investment, interest is calculated every year and interest earned is added once a year. ✓✓
 In the second investment, interest is calculated every month and interest earned is added every month. This investment will increase faster. ✓✓
 2.4 The second investment grows faster so the interest earned will be higher than the first investment. ✓
 2.5 The second investment. The interest will keep on growing faster than the first investment. ✓✓

Worksheet 8: Loans

1. $5 \times 12 = 60 \checkmark$
 $22,24 \checkmark \times 60 \checkmark \times (30\,000 \div 1\,000) \checkmark = R40\,032,00 \checkmark$
2. $10 \times 12 = 120 \checkmark$
 $15,53 \checkmark \times 120 \checkmark \times (25\,000 \div 1\,000) \checkmark = R46\,590,00 \checkmark$
3. $20 \times 12 = 240 \checkmark$
 $74\,000 \div 1\,000 = 74 \checkmark$
 $240 \times 74 \times 9,65 \checkmark = R171\,384 \checkmark$
 $240 \times 74 \times 10,32 \checkmark = R183\,283,20 \checkmark$
4. $183\,283,20 - 171\,384 \checkmark \checkmark = R11\,899,20 \checkmark \checkmark$

Exam-type questions: Paper 1

- | | | | | | |
|-----|--------------------------------------|-----|--------------------------------------|-----|--------------------------------------|
| 1.1 | G $\checkmark \checkmark \checkmark$ | 1.2 | E $\checkmark \checkmark \checkmark$ | 1.3 | H $\checkmark \checkmark \checkmark$ |
| 1.4 | A $\checkmark \checkmark \checkmark$ | 1.5 | F $\checkmark \checkmark \checkmark$ | 1.6 | D $\checkmark \checkmark \checkmark$ |
| 1.7 | B $\checkmark \checkmark \checkmark$ | 1.8 | C $\checkmark \checkmark \checkmark$ | | |

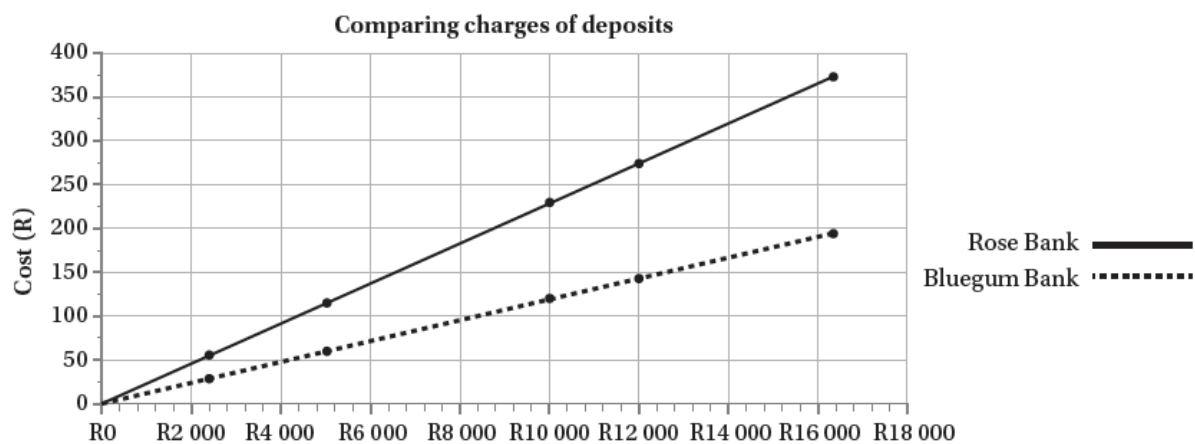
- 2.1. A: $5\,250 \times 13,5 \times (1) \checkmark = R708,75 \checkmark$
B: $5\,250 \times 14,5 \times (1 \div 12) \checkmark = 63,44$
 $5\,250 + 63,44 = 5\,313,44$
 $5\,313,44 + 64,20 = 5\,377,64$
 $5\,377,64 + 64,98 = 5\,442,62$
 $5\,442,62 + 65,77 = 5\,508,39$
 $5\,508,39 + 66,56 = 5\,574,95$
 $5\,574,95 + 67,36 = 5\,642,31$
Interest = $5\,642,31 - 5\,250 = R392,31 \checkmark$
A will be higher. $\checkmark$
- 2.2. A: $15\,000 \times 12\% \times 3 \checkmark = 5\,400 \checkmark$
B: $15\,000 \times 12\% \times 1 \checkmark = 1\,800 \checkmark$
 $15\,000 + 1\,800 = 16\,800 \checkmark$
 $16\,800 \times 12\% \times 1 = 2\,016 \checkmark$
 $16\,800 + 2\,016 = 18\,816 \checkmark$
 $18\,816 \times 12\% \times 1 = 2\,257,92 \checkmark$
Total interest = $1\,800 + 2\,016 + 2\,257,92 = R6\,073,92 \checkmark$
B will be the highest. $\checkmark$
- 3.1 $1\,500 - 300 \checkmark \checkmark = R1\,200,00 \checkmark$
3.2 $1200 \times 9/100 \times (9 \div 12) \checkmark = 81 \checkmark$
 $1200 + 300 + 81 \checkmark = R1\,581 \checkmark$
 $\frac{81}{1500} \times \frac{100}{1} = 5,4\% \checkmark \checkmark$
No, the statement is incorrect, it is not 11%. $\checkmark$
- 4.1 $4,25 + 1,05(35\,500/100) \checkmark \checkmark = R377 \checkmark = R32,00 \checkmark$ Maximum value
4.2 $20 + 2,50(25\,140/100) \checkmark \checkmark = R648,50 \checkmark = R600,00 \checkmark$ Maximum value
4.3 $R73,00 \checkmark \checkmark$
4.4 $R37,00 \times 5 \checkmark = R185,00 \checkmark$
4.5 $R8,50 \checkmark \checkmark$

Exam-type questions: Paper 2

- 1.1 $\frac{500}{4\,999} \times \frac{100}{1} \checkmark \checkmark = 10\% \checkmark$
1.2 $149,97 \times 12 \checkmark \checkmark = R1\,799,64 \checkmark$
1.3 $500 + (149,97 \times 48) \checkmark \checkmark = R7\,698,56 \checkmark \checkmark$
1.4 $R7\,697,56 - R4\,999,00 \checkmark \checkmark = R2\,698,56 \checkmark$
1.5 The cash option. $\checkmark$ It has no interest added. $\checkmark \checkmark$
1.6 May not have enough money to buy the TV cash. $\checkmark \checkmark$
Can't wait to save to buy the TV cash. $\checkmark \checkmark$

- 2.1.1 $3,85 + (5\,000 \times 1,15\%) \checkmark\checkmark = R61,35 \checkmark\checkmark$
 2.1.2 $3,85 + (10\,000 \times 1,15\%) \checkmark\checkmark = R118,85 \checkmark\checkmark$
 2.1.3 $1,60 + 2,25(10\,000 \div 100) \checkmark = 1,60 + 2,25 (100) \checkmark = R226,60 \checkmark\checkmark$
 2.1.4 $1,60 + 2,25(12\,000 \div 100) \checkmark = 1,60 + 2,25 (120) \checkmark = R271,60 \checkmark\checkmark$

- 2.2 Rose Bank $\checkmark\checkmark$
 2.3 Other services that Rose Bank does not provide. $\checkmark\checkmark$
 Other services could be cheaper. $\checkmark\checkmark$
 2.4



- $\checkmark\checkmark$ Rose Bank cost at R2 500; $\checkmark\checkmark$ Rose Bank cost at R16 500; $\checkmark$ Connecting data points; $\checkmark$ Legend
 $\checkmark\checkmark$ Bluegum Bank cost at R2 500; $\checkmark\checkmark$ Bluegum Bank cost at R16 500; $\checkmark$ Connecting data points;
 $\checkmark$ Legend

- 3.1.1 $2\,846,15 - 2\,256,81 \checkmark\checkmark = R589,34 \checkmark$
 3.1.2 $2\,256,81 - 949,00 \checkmark\checkmark = R1\,307,81 \checkmark$
 3.2 Debit balance $\checkmark$ She has taken more money from the bank account than she had in the account. $\checkmark\checkmark$
 3.3 When money is deposited into her account $\checkmark\checkmark$

Topic 5 Small business finance ANSWERS

Worksheet 1: Comparing budgets

1. Under income: capital and loan for start-up income. ✓✓
Under irregular expenses: new equipment, installation and setting factory. ✓✓
2. It is not entries that appears every year. ✓✓
When capital or a loan is used, the amount will differ, depending on what is needed. ✓✓
3. Under fixed expenses, entry for interest on loan. ✓✓
4. $\frac{480\,000}{880\,000} \times \frac{100}{1} \checkmark\checkmark = 54,55\% \checkmark$
5. $\frac{863\,988 - (53\,500 + 6\,500 + 30\,000 + 15\,000)}{863\,988} \times \frac{100}{1} \checkmark\checkmark = 87,85\% \checkmark$
6. 54,55% of the income is used to pay 87,85% of the expenditure. ✓✓
There will be a shortage in the future unless regular income is increased, or regular expenditure is decreased. ✓✓
7. $950\,000 - 480\,000 \checkmark\checkmark = R470\,000 \checkmark$
8. The first year of production is difficult. Different problems occur, buyers need to feel confident with production and that is built over time. ✓✓
9. Inflation makes expenditure amounts increase. As income from sales increase, the cost of sales and amount paid as tax will also increase. ✓✓
10. $211\,200 \times 1\% \checkmark\checkmark = R2\,112,00 \checkmark$ They are paying the correct amount. ✓
11. When the interest rate changes ✓✓
When the loan amount changes ✓✓
When the loan has been repaid ✓✓
12. As the equipment gets older, the possibility of equipment failure increases; ✓✓
Inflation will increase the cost of repair work. ✓✓
13. Cut down on unnecessary expenses. ✓✓
Invest in marketing to increase sales. ✓✓

Worksheet 2: Income and expenditure statements

1. $18\,000 \times 1\% \checkmark = R180,00 \checkmark$
2. $158\,925,00 - (250 - 180) \checkmark\checkmark = 158\,925 - 70 = R158\,855,00 \checkmark$
3. All installation is not completed yet. ✓✓
Not all equipment is bought yet. ✓✓
4. $35\,000 \checkmark - (7\,000 + 2\,549 + 18\,000 + 180 + 250) \checkmark - (12\,000 + 2\,346 + 2\,124 + 15\,345 + 4\,995) \checkmark$
 $35\,000 - 27\,979 - 36\,810 \checkmark = -R29\,789,00 \checkmark$
No, income is not enough to cover expenses. ✓ [Note, the shortfall is big enough, so it doesn't matter whether the original or corrected UIF amount is used.]

Worksheet 3: Working with income and expenditure statements

1. There is no irregular income. ✓✓
2. Yes. ✓ $48\,946 - 35\,000 = R13\,946,00 \checkmark\checkmark$
3. The items that are sold need to be produced. ✓✓
4. The funds received from as Capital and Loans have already been received. The business' financials will show there is a surplus of funds in the bank account. ✓✓
Some of the irregular expenses are paid in October with the funds and some of the funds will be used to pay in November. ✓ The irregular income is also used to cover the shortfall in sales during the start-up months. ✓
5. $(250\,000 + 150\,000) \checkmark - (54\,879 + 6\,800 + 31\,987 + 41\,319 + 8\,974 + 43\,156) \checkmark\checkmark$
 $= 400\,000 - 187\,115 = R212\,885,00 \checkmark$
Yes. ✓
6. All equipment has not been bought or installed. ✓
There is excess being kept for shortfall in sales during the start-up months. ✓
Not even half of the funds for capital and loans has been used. ✓✓

Worksheet 4: Investment options

- 1.1 $15\,000 \times 1,64531 \checkmark\checkmark = R24\,679,65 \checkmark$
1.2 $15\,000 \times 2,707 \checkmark\checkmark = R40\,605,00 \checkmark$
- 2.1 $15\,000 \times 1,8167 \checkmark\checkmark = R27\,250,50 \checkmark$
2.2 $15\,000 \times 3,3 \checkmark\checkmark = R49\,500,00 \checkmark$
- 3.1 $11\%: 15\,000 \times 1,728916 \checkmark\checkmark = R25\,933,74 \checkmark$
 $25\,933,74 - 24\,679,65 \checkmark = R1\,254,09 \checkmark$
3.2 $11\%: 15\,000 \times 2,989 \checkmark\checkmark = R44\,835 \checkmark$
 $44\,835 - 40\,605 \checkmark = R4\,230 \checkmark$
4. At the end of the period. Either at the end of 5 years or 10 years, depending on which time period they choose for the investment. $\checkmark\checkmark$
5. No, probably not. $\checkmark\checkmark$
6. The interest rate will probable decrease. $\checkmark\checkmark$
7. They can increase the initial investment amount. $\checkmark\checkmark$

Worksheet 5: Cost calculations

1. R1 500 $\checkmark\checkmark$
2. R1 500 $\checkmark\checkmark$ That worker needs to fund the total cost. $\checkmark$
3. R550 $\checkmark\checkmark$
- 4.1 R10 000 $\checkmark\checkmark$
4.2 R2 500 $\checkmark\checkmark$
4.3 $3\,000 \div 5 \checkmark = R600 \checkmark$
4.4 $5\,500 \div 5 \checkmark = R1\,100 \checkmark$
4.5 $10\,000 \div 10 \checkmark = R1\,000 \checkmark$
4.6 $1\,500 \div 10 \checkmark = R150 \checkmark$
- 5.1 $1\,000 + 250 + 550 \checkmark = R1\,800 \checkmark$
5.2 $1\,000 + 300 + 150 \checkmark = R1\,450 \checkmark$
5.3 $1\,000 + 250 + 550 + 150 \checkmark = R1\,950 \checkmark$

Worksheet 6: Cost price and selling price

- 1.1 $458,67 \times 115 \div 100 \checkmark\checkmark = R527,47 \checkmark\checkmark$
1.2 $173,00 - 129,29 \checkmark = 43,71 \checkmark$ $(43,71 \div 129,29) \times (100 \div 1) \checkmark = 33,81\% \checkmark$
1.3 $149,99 \times 100 \div 110 \checkmark\checkmark = R136,35 \checkmark\checkmark$
1.4 $99,49 \times 212,5 \div 100 \checkmark\checkmark = R211,42 \checkmark\checkmark$
1.5 $249,99 - 201,97 \checkmark = 48,02 \checkmark$ $(48,02 \div 201,97) \times (100 \div 1) \checkmark = 23,77\% \checkmark$
2. Some items are more valuable than others. Customers are willing to pay more. $\checkmark\checkmark$
3. $33,81 + 15 = 48,81\% \checkmark$
 $129,29 \times 148,81 \div 100 \checkmark = R192,39 \checkmark$

Worksheet 7: Cost calculation and profit or loss (1)

- 1.1 $5,94 \times 50 \checkmark\checkmark = R297,00 \checkmark$
1.2 $1\,500 + 297 \checkmark = R1\,797,00 \checkmark$
1.3 $1\,797 \div 50 \checkmark = R35,94 \checkmark$
1.4 $14,49 \times 50 \checkmark = R724,50 \checkmark$
1.5 $1\,797 - 724,50 \checkmark = R1\,072,50 \checkmark$ Loss $\checkmark$
- 2.1 R1 500,00 $\checkmark$
2.2 $2\,539,50 - 1\,500 \checkmark = R1\,039,50 \checkmark$
2.3 $1\,039,50 \div 5,94 \checkmark\checkmark = R175,00 \checkmark$
2.4 $2\,539,50 \div 175 \checkmark = R14,51 \checkmark$

2.5 $14,49 \times 175 \checkmark = R2\ 535,75 \checkmark$

2.6 a loss of R3,75 $\checkmark\checkmark$

3. The same cost for all production numbers. $\checkmark\checkmark$

4. At production of 175 loaves the income and the expenditure are basically the same. $\checkmark\checkmark$

All expenditures are covered. If they make 1 more loaf, the income will be more than the expenditure and they will start making a profit. $\checkmark\checkmark$

Worksheet 8: Cost calculation and profit or loss (2)

1.1 R15,90 $\checkmark$ The selling price remains the same no matter how many units are sold. $\checkmark$

1.2 $1\ 590,00 - 2\ 340,00 \checkmark\checkmark = -R750,00 \checkmark$

1.3 $1\ 500,00 + 1\ 680,00 \checkmark\checkmark = R3\ 180,00 \checkmark$

1.4 $15,90 \times 200 \checkmark = R3\ 180,00 \checkmark$

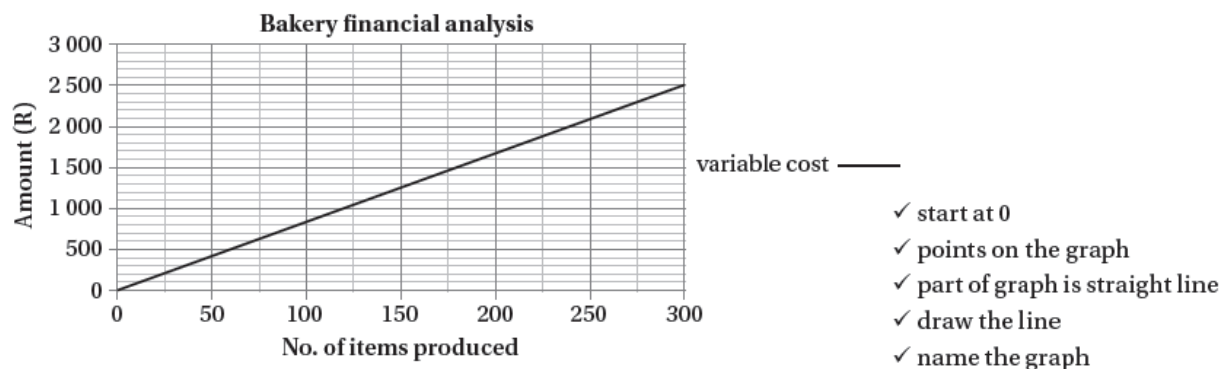
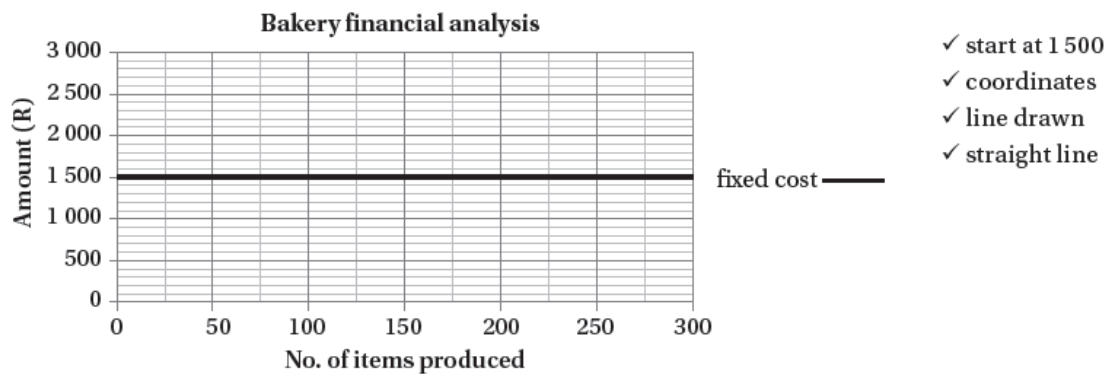
1.5 $3\ 180 - 3\ 180 \checkmark\checkmark = R0 \checkmark$

1.6 $8,40 \times 300 \checkmark\checkmark = R2\ 520,00 \checkmark$

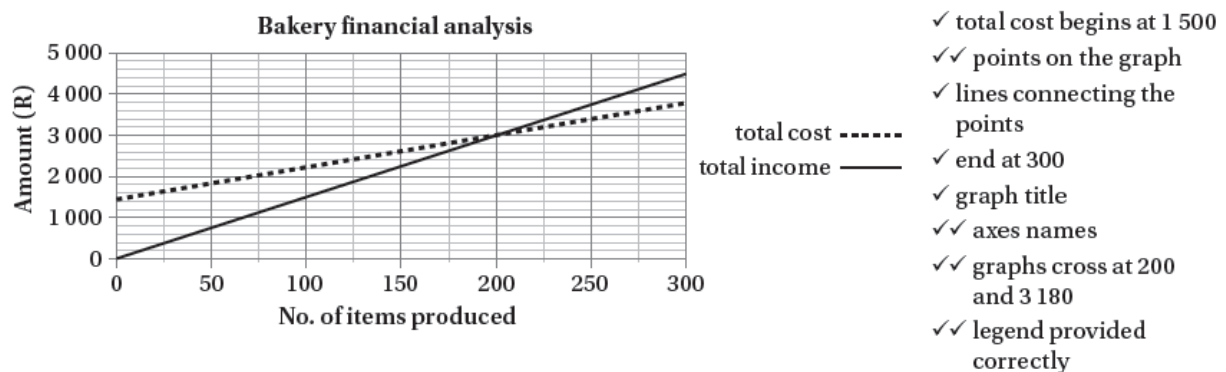
1.7 R15,90 $\checkmark$

1.8 $4\ 770 - 4\ 020 \checkmark = R\ 750,00 \checkmark$

2.



3.



4. 200 loaves of bread ✓✓ at a total cost of R3 180,00 ✓✓
5. The break-even point. ✓✓
6. The bakery will suffer a loss. ✓✓
7. The bakery will earn a profit. ✓✓

Exam-type questions: Paper 1

- 1.1 F ✓✓
- 1.2 H ✓✓
- 1.3 I ✓✓
- 1.4 G ✓✓
- 1.5 D ✓✓
- 1.6 C ✓✓
- 1.7 B ✓✓
- 1.8 E ✓✓
- 1.9 A ✓✓

- 2.1.1 $40\,000 + 100\,000 + 20\,000 \checkmark = R160\,000 \checkmark$
- 2.1.2 $160\,000 - 152\,999 \checkmark = R7\,001 \checkmark$
- 2.2 A new business needs additional funding to get started. ✓✓
Capital is self-generated funds and when there isn't enough, they will need a loan to fund the business. ✓✓
- 2.3 Yes. ✓ Under irregular expenses that are installation and new equipment that was bought. This will only be when the business is starting up. ✓
- 2.4 There will be a surplus. ✓ The income is more than the expenditure. ✓✓
- 2.5 $160\,000 - 120\,000 \checkmark = R40\,000 \checkmark$
- 2.6 $152\,999 - (53\,500 + 6\,500 + 30\,000) \checkmark\checkmark = R62\,999 \checkmark$
- 2.7 A shortage. ✓ $40\,000 - 62\,999 = -R22\,999 \checkmark$
- 2.8 Under irregular expenses. ✓✓ The cost for repair work will not always be the same amount. ✓✓
- 2.9 Yes. ✓ Expenditure will increase without the income increasing which means that the surplus will decrease, or the shortage will increase. ✓✓

- 3.1 $875 \div 125 \checkmark = R7 \checkmark$
- 3.2 $1\,349 \times 7 \checkmark = R9\,443 \checkmark$
- 3.3 $35\,000 + (4\,500 \times 7) \checkmark\checkmark = R66\,500 \checkmark\checkmark$
- 3.4 $35\,000 + (5\,125 \times 7) \checkmark\checkmark = R70\,875 \checkmark\checkmark\checkmark$
- 3.5 $70\,875 \div 5\,125 \checkmark\checkmark = R13,83 \checkmark\checkmark$
- 3.6 $13,83 \times 135/100 \checkmark\checkmark = R18,67 \checkmark\checkmark$
- 3.7 $5\,125 \times 18,67 \checkmark = R95\,683,75 \checkmark$
- 3.8 $95\,683,75 - 70\,875 \checkmark = R24\,808,75 \checkmark$ Make a profit. ✓

Exam-type questions: Paper 2

- 1.1.1 $50 \times 205 \checkmark = R10\,250 \checkmark$
- 1.1.2 $75 \times 205 \checkmark = R15\,375 \checkmark$
- 1.1.3 $20\,500 \div 205 \checkmark = 100$ guests ✓

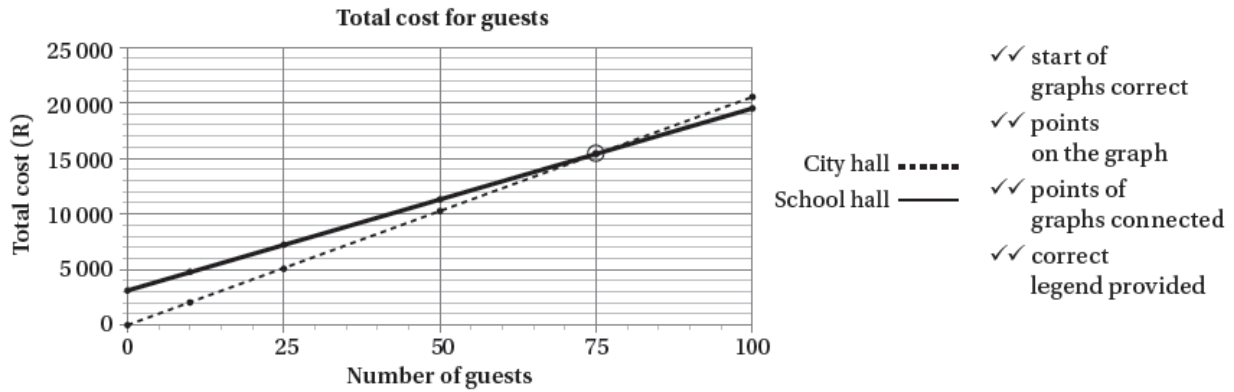
- 1.2.1 $H = 3\,000 \checkmark + (75 \checkmark \times n) \checkmark$
- 1.2.2 $H = 3\,000 \checkmark + (75 \times 75) \checkmark = R8\,625 \checkmark$
- 1.2.3.1 $R3\,000 \checkmark\checkmark$
- 1.2.3.2 $3\,000 + (75 \times 50) \checkmark = R6\,750 \checkmark$

- 1.3.1 $25 \times 90 \checkmark = R2\,250 \checkmark$
- 1.3.2 $100 \times 90 \checkmark = R9\,000 \checkmark$
- 1.3.3 $6\,750 + 4\,500 \checkmark = R11\,250 \checkmark$
- 1.3.4 $10\,500 + 9\,000 \checkmark = R19\,500 \checkmark$

- 1.4.1 $R75 \checkmark\checkmark$
- 1.4.2 $R15\,375 \checkmark\checkmark$

- 1.5.1 School hall: R11 250 ✓✓
City hall: R10 250 ✓✓
- 1.5.2 School hall: R15 375 ✓✓
City hall: R15 375 ✓✓
- 1.5.3 School hall: R19 500 ✓✓
City hall: R20 500 ✓✓

1.6



- 1.7 Circled point above in 1.6 ✓✓
- 1.8 School hall. ✓ The cost is lower than City Hall. ✓✓
- 1.9.1 $23\,000 \div 10 \checkmark = R2\,300 \checkmark$
- 1.9.2 $23\,000 \div 50 \checkmark = R460 \checkmark$
- 1.10 $23\,000 - 19\,500 \checkmark\checkmark = R3\,500 \checkmark$
- 2.1.1 $15\,450 \div 62 \checkmark = R249,19 \checkmark$
- 2.1.2 $13\,500 \div 300 \checkmark = R45 \checkmark$
- 2.1.3 $5\,250 \div 150 \checkmark = R35 \checkmark$
- 2.1.4 $1\,000 \div 500 \checkmark = R2 \checkmark$
- 2.1.5 $70 + (70 \div 3) \checkmark\checkmark = R93,33 \checkmark\checkmark$
- 2.1.6 $750 \div 150 \checkmark = R5 \checkmark$
- 2.1.7 $249,19 + 45 + 35 + 2 + 93,33 + 5 + 25 \checkmark\checkmark = R454,52 \checkmark$
- 2.2 $15\,450 + 13\,500 + 5\,250 + 1\,000 + 93,33 + 750 \checkmark\checkmark = R36\,043,33 \checkmark$
- 2.3 The business will produce other clothing items as well and the admin costs will need to be divided by those number of items as well. ✓✓
- 2.4 $454,52 \times 10 \checkmark\checkmark = R4\,542,20 \checkmark$
- 2.5 $454,52 - 550,00 \checkmark = R95,48 \checkmark$
- 2.6 $95,48 \div 454,52 \times 100 \div 1 \checkmark = 21,01\% \checkmark$ No, the statement is incorrect. ✓

Topic 6 Data handling ANSWERS

Worksheet 1: Develop questions and collect data

- 1.1 No ✓
The question does not indicate:
- type of school (primary/secondary)
 - for boys or girls
 - prize category
 - time of day
 - health issues (allergies; diabetes, etc.) (any one) ✓
- 1.2 Yes ✓✓
- 1.3 No ✓ crunchy is a bias ✓
2. Observation; ✓ interviews; ✓ surveys ✓
- 3.1 Survey/observation ✓✓
- 3.2 Survey ✓✓
- 3.3 Interview ✓✓
- 3.4 Survey ✓✓
- 4.1 Learners at the School ✓✓
- 4.2 C; ✓ nobody is excluded ✓✓
- 4.3 Survey ✓✓
- 4.4 To determine the least popular sport at the school ✓✓
- 4.5 Bias: scuba diving ✓✓
Constraint: question does not select a population or sample group ✓✓
- 5.1 C ✓✓
- 5.2 D ✓✓

Worksheet 2: Classify and organise data

- 1.1 Categorical data can be observed not measured (e.g. male/female, cars, etc.);
Collected in words Yes/No ✓✓
Numerical data can be counted or measured; presented in numerical numbers (eg.20; 21,5; $\frac{2}{3}$; 0,22) ✓✓
- 1.2 Categorical: ✓ data is observed prefer a certain type of response: yes/ no ✓✓
[Yes or no for tweet/share/like]
- 1.3 Numerical: ✓ data is measured and presented in numbers ✓✓
- 1.4 Discrete numerical data: - can be counted; ✓ - are whole positive numbers ✓ continuous numerical data: - can be measured; ✓ - can be whole numbers, fractions and decimal numbers ✓
- 1.5 Continuous ✓ - can measured; ✓ - can be whole numbers, fractions and decimal numbers ✓
- 1.6 Numerical, discrete ✓✓

- 2.1 Use the data and complete the frequency table:

	Girls		Boys	
	tally	frequency	tally	frequency
W	IIII ✓	4 ✓	II ✓	2 ✓
C	III ✓	3 ✓	IIII ✓	4 ✓
F	I ✓	1 ✓	III ✓	3 ✓
S	II ✓	2 ✓	I ✓	1 ✓
TOTAL		10 ✓		10 ✓

- 2.2 20 ✓✓
- 2.3 Water ✓✓
- 2.4 Slush puppy ✓✓
- 2.5 Categorical ✓✓ (data is a yes or no choice)

Worksheet 3: Summarise data

1.1 Learners: $\frac{8 + 17 + 32 + 25 + 10 + 5 + 3 + 8 + 5}{9} = \frac{113}{9} = 12,56 \approx 12$ words ✓

Teachers: $\frac{28 + 37 + 32 + 45 + 30 + 15 + 5 + 33 + 25 + 29}{10} = \frac{279}{10} = 27,9 \approx 27$ words ✓

1.2 Learners: 5 and 8 ✓✓
Teachers: none (remember: zero is wrong) ✓✓

1.3 Learners: 3 ; 5 ; 5 ; 8 ; 8 ; 10 ; 17 ; 25 ; 32 ✓
median = 8 ✓

Teachers: 5 ; 15 ; 25 ; 28 ; 29 ; 30 ; 32 ; 33 ; 37 ; 45 ✓
median = $\frac{29 + 30}{2} = 29,5$ ✓

1.4 Learners: median ✓, because 32 is very high value and an outlier ✓✓

1.5 Learners: $32 - 3 = 29$ ✓

Teachers: $45 - 5 = 40$ ✓

1.6 Teachers difference between highest and lowest value is longer; the data set is more spread out. ✓ A possible reason is that the learners use a cryptic/phonetic language. ✓

2.1 Student A Student B
Mean = $85 + 75 + 95 = \frac{225}{3} = 85\%$ ✓ Mean = $80 + 82 + 81 = \frac{243}{3} = 81\%$ ✓

2.2 Range = $95 - 75 = 20$ ✓ Range = $82 - 80 = 2$ ✓

2.3 Student B's range is less spread out ✓ meaning that this student's marks are constantly ✓ the same due to hard work. ✓

3.1 $\frac{25 + 24 + 21 + 19 + 21 + 24}{6} = 22,3^\circ\text{C}$ ✓

3.2 18 ; 16 ; 10 ; 10 ; 12 ; 17 ✓
 $\frac{10 + 18}{2} = 14^\circ\text{C}$ ✓

3.3 10°C ✓✓

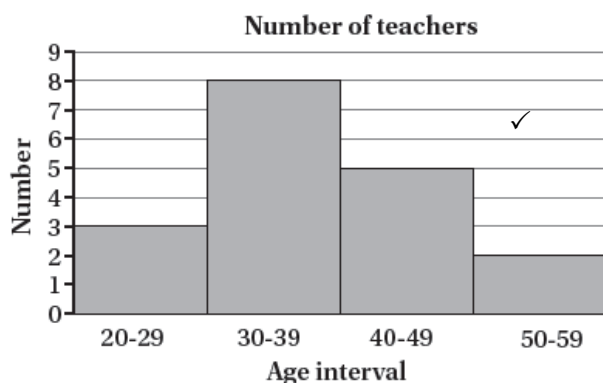
3.4 $21 - 10 = 11^\circ\text{C}$ ✓

Worksheet 4: Graph data

1.1 It is numerical, continuous data. ✓✓

1.2 Each sector represents a fraction of the total data base. ✓✓

1.3



✓✓✓✓ four correct bars on graph;
✓ type of graph (no spaces)

2.1 50 ✓✓

2.2 20 ✓✓

2.3 $40 + 20 + 30 = 90$ ✓✓✓

2.4 $40 - 30 = 10$ ✓✓

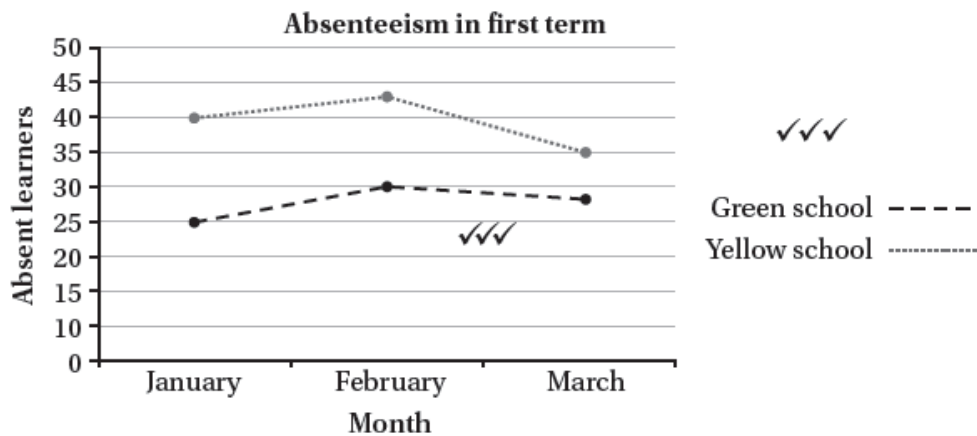
2.5 $70 + 60 + 50 = 180$ ✓✓✓

3.1 Discreet ✓✓

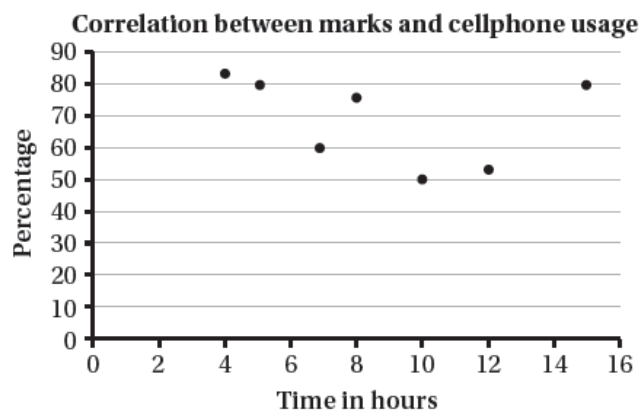
3.2 Broken line ✓, because the values are discreet. ✓

3.3 Yellow school ✓✓

3.4



4.1



4.2 Negative correlation ✓✓

4.3 (15;80) ✓✓

Exam-type questions: Paper 1

1.1 voters age group 18 to 39 ✓✓

1.2 The sample is free from bias (representative of the population in terms of gender and age); ✓ randomly chosen; ✓ and large enough. ✓

1.3 age group 30–39 ✓ The age group with the highest frequency. ✓

1.4.1 5 760 in thousands ✓

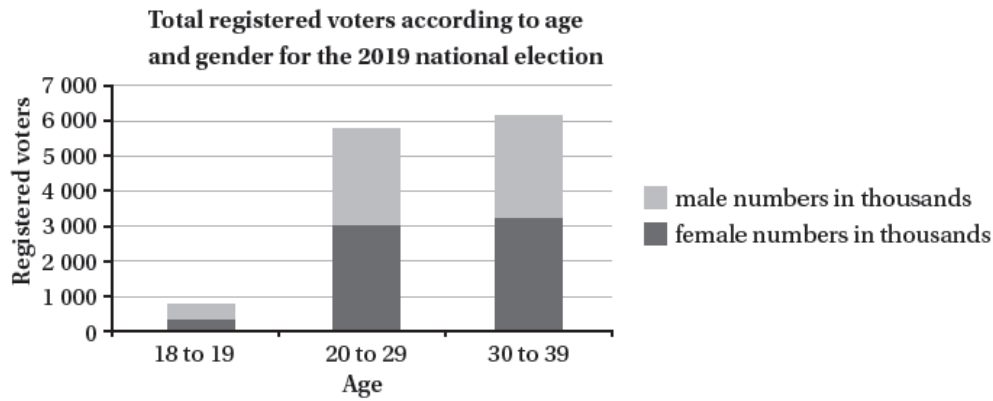
1.4.2 5 911 in thousands ✓

1.4.3 12 545 in thousands ✓

1.5 $\frac{297\ 000}{612\ 000} \times \frac{100}{1} = 48,53\%$ ✓

1.6 18 to 19 year old males ✓✓

1.7



18-19 ✓✓; 20-29 ✓✓; 30-39 ✓; numbers in thousands on y-axis ✓; male and female indicated ✓

1.8 Indicate the cumulative totals per category ✓✓

2.1.1 15,6 ✓

2.1.2 27,2 ✓

2.2 $-10,6 \checkmark - (-27,8) \checkmark = 17,2 \checkmark$

2.3 May ✓✓

2.4 Median ✓, outlier $30,4^{\circ}\text{C}$ affects the mean value ✓ and there is no mode. ✓

2.5 $\frac{(30,4-13,3) \checkmark}{13,3 \checkmark} \times \frac{100 \checkmark}{1} = 128,57\% \checkmark$

3.1 From graph:

In school A: 70% pass $\therefore \frac{70}{100} \times 1\,000 \text{ learners} = 700 \text{ pass, and } 300 \text{ fail} \checkmark$

In school B: 50% pass $\therefore \frac{50}{100} \times 3\,000 \text{ learners} = 1\,500 \text{ pass, and } 1\,500 \text{ fail} \checkmark$

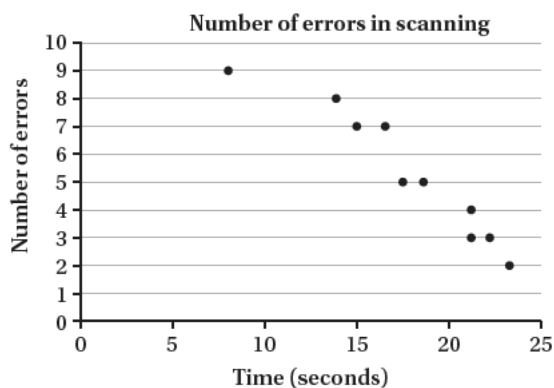
In school C: 60% pass $\therefore \frac{60}{100} \times 1\,500 \text{ learners} = 900 \text{ pass, and } 300 \text{ fail} \checkmark$

Thus, School B has the highest number of learners that passed. ✓✓

3.2.1 The paper refers to the *number of learners* ✓ that pass ✓ and not the percentage. ✓

3.2.2 School A has the highest pass rate ✓✓

4.1



✓ name x-axis; ✓ name y-axis; ✓✓ 5 to 10 plots correct; ✓ 1 to 4 plots correct

4.2 negative correlation ✓✓

4.3 The less time taken the more mistakes were made. ✓✓

4.4 discrete ✓✓

Exam-type questions: Paper 2

- 1.1 $\frac{96,7 + 21,2}{2} \checkmark = 58,95\%$
 $58,95\% \checkmark - 55\% \checkmark = 3,95\% \checkmark$
- 1.2 None, (there is no clear mode but some values like 48% and 48,8% are quite close.) $\checkmark \checkmark$
- 1.3 Mean: $\frac{45,9 + 86,3 + 0 + 86,6 + 98,8 + 22,4 + 21,2 + 96,7 + 71,5 + 27,4 + 52,8 + 43,7}{12} \checkmark = 54,44\% \checkmark$
- Median: 0; 21,2; 22,4; 27,4; 43,7; 45,9; 52,8; 71,5; 86,3; 86,6; 96,7; 98,8 $\checkmark$
 $\frac{45,9 + 52,8}{2} \checkmark = 49,35\% \checkmark$
- 1.4 Median, $\checkmark$ because 0 is an outlier $\checkmark$ and there is no modus. $\checkmark$
- 1.5 $\frac{48}{100} \times 5\,350\,000\,000 \checkmark = 2\,568\,000\,000 \text{ kL} = 2\,568\,000 \text{ ML} \checkmark \checkmark$
- 1.6 Dams in South Africa $\checkmark \checkmark$

2.1 Gr 11A

Mean:

$$\frac{18 + 31 + 45 + 45 + 45 + 51 + 51 + 58 + 69 + 69 + 69 + 82 + 87 + 88}{14} = 57,7 \checkmark$$

Median: $\frac{51 + 58}{2} = 54,5 \checkmark$

Mode: 45 $\checkmark$ and 69 $\checkmark$

Range: $88 - 18 = 70 \checkmark$

Gr 11B

Mean:

$$\frac{18 + 18 + 18 + 45 + 45 + 51 + 51 + 58 + 71 + 75 + 75 + 82 + 82 + 98}{14} = 56,2 \checkmark$$

Median: $\frac{51 + 58}{2} = 54,5 \checkmark$

Mode: 18 $\checkmark$

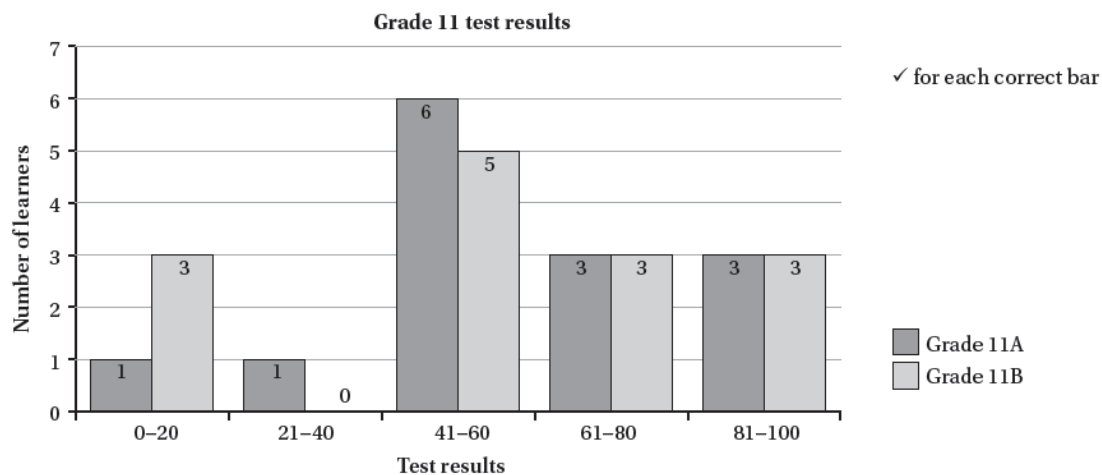
Range: $98 - 18 = 80 \checkmark$

- 2.2 Gr 11A is better, $\checkmark \checkmark$ as the mode is higher $\checkmark$ and range is smaller. $\checkmark$

2.3

Grade 11 test results				
Category	Gr 11A		Gr 11B	
	tally	frequency	tally	frequency
0-20	I $\checkmark$	1	III	3 $\checkmark$
21-40	I $\checkmark$	1		0 $\checkmark$
41-60	HH I $\checkmark$	6	HHH	5 $\checkmark$
61-80	III $\checkmark$	3	III	3 $\checkmark$
81-100	III $\checkmark$	3	III	3 $\checkmark$

2.4



2.5 data is numeric, continuous ✓✓

3.1 $\frac{20}{100} \times 2\,000 \checkmark = 400 \checkmark$

3.2 Blue ✓✓

3.3 All the black garments is $\frac{25}{100} \times 2\,000 \checkmark = 500$

20% is $\frac{20}{100} \checkmark \times 500 \checkmark = 100 \checkmark$

3.4 $\frac{50}{100} \times 2\,000 \checkmark \times 5 \checkmark = 5\,000$

$\frac{10}{100} \times 2\,000 \checkmark \times 2 \checkmark = 400$

$5\,000 + 400 \checkmark = 5\,400 \checkmark$

4.1 Population: world ✓ Sample: most polluted cities of the world ✓

4.2 India ✓✓ $153 - 88 \checkmark = 65 \checkmark$

4.3 88 ✓✓

4.4 96 ✓✓