

Worksheet 2

Exponents with fractions

Simplify.

1. $(27)^{\frac{2}{3}}$

2. $(100)^{\frac{3}{2}}$

3. $(9)^{\frac{3}{2}}$

4. $(4)^{\frac{1}{2}} \times (16)^{\frac{3}{2}}$

5. $(8)^{\frac{1}{3}} + (27)^{\frac{1}{3}}$

6. $2x^{\frac{2}{3}} \times 5x^{\frac{3}{2}}$

7. $3x^{\frac{1}{2}} + 5x^{\frac{1}{2}}$

8. $\frac{x^{\frac{1}{3}}}{x^{-\frac{2}{3}}}$

9. $\frac{18x}{6x^{\frac{1}{2}}}$

10. $(x^5)^{\frac{2}{3}}$

Exponential equations

Simplify.

1. $2^x = 32$

2. $2^x = \frac{1}{64}$

3. $3^{-3x} = \frac{1}{9}$

4. $2^{\frac{4}{x}} = 16$

5. $2^{x+1} = \frac{1}{16}$

6. $16^{2x+3} = 32^{x+4}$

7. $5^{2x+1} = 1$

8. $3^{x+1} + 3^x = 36$

9. $2^x + 2^x = 32$

10. $\frac{5^2}{5^{-x}} = 125$

Exam-type questions

Simplify each expression and solve the equation. Express positive exponents in the answers.

1. $3^2 - 2^{-2} + 81^{\frac{1}{2}}$

2. $\frac{9x^2y^3 \times 6x^5y^{-7}}{36x^1y^{-6}}$

3. $\left(\frac{16x^4}{y^6}\right)^{-\frac{1}{2}}$

4. $x^{\frac{1}{2}}\left(x^{\frac{-1}{2}} - x^{\frac{1}{2}}\right)$

5. $\frac{(2^{x+1})^3}{\sqrt[3]{64}}$

6. $\left[\frac{25x^{-5}y}{16xy^{-3}}\right]^{\frac{-1}{2}}$

7. $[(x^{-3})^{-4}]^{-5}$

8. $\frac{3 \cdot 2^{x+1} - 2^{x+2} + 2^x}{8 \cdot 2^{x-2}}$

9. $2x^{\frac{3}{4}} + 3 = 57$

10. $2^x + 2^x + 2^x + 2^x = 128$

11. $\frac{4}{\sqrt[3]{x} + 3} = \frac{2}{3}$

12. $3x^{\frac{-5}{3}} + 14 = 110$