Worksheet 1

Solving equations with algebraic fractions

Solve each algebraic equation with fractions.

1. $\frac{6}{x+1} = x + 2$

2 $\frac{8}{x-7} = x$

3. $\frac{x+2}{x+1} - \frac{3}{x-2} = \frac{1}{x+1}$

4. $\frac{(x+5)(x-6)}{2} = \frac{(x-1)(x-4)}{3}$

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

6. $\frac{3}{x+1} - \frac{2}{4-x} = \frac{4x-11}{x^2-3x-4}$

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

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

9. $\frac{4}{x+3} = \frac{5x-5}{x^2+x-6} + \frac{4}{x^2-4}$

10. $\frac{3x+8}{x^2+x-2} - \frac{2x-3}{x^2+6x+8} = \frac{4-x}{x^2+3x-4}$

Exam-type questions

1. Simplify the following without using a calculator.

1.1 $25^{\frac{3}{2}}$

1.2 $\left(\frac{81}{256}\right)^{-\frac{3}{4}}$

1.3 $6^0 + \sqrt{2^4} - \sqrt[3]{8^2} + (0{,}5)^{-2}$

1.4 $\frac{(2+3^{-1})^{-2}}{(3^{-1}+2)^{-1}}$

1.5 $\frac{6^{x+3} \cdot 3^{1+x}}{18^{x+2}}$

1.6 $(5\sqrt{2} - \sqrt{3})^2 - (\sqrt{2} - 5\sqrt{3})^2$

1.7 $\sqrt[n]{\frac{6^n + 3^{n+2}}{2^n + 9}}$

1.8 $\frac{2^{2m+2} - 3\sqrt{4^{2m+2}}}{16^{\frac{m}{2}} + 3 \cdot 4^{m+1}}$

1.9 $\frac{4^x \cdot 2^{x+2} - 8^x}{2^{3x+2}}$

1.10 $\frac{a(a+2)}{a^2+a-2} - \frac{a}{a+1}$

2. Solve for x: $2 \cdot 4^{x-1} = \frac{16}{8^x}$

3. Simplify: $\sqrt[x]{27} = 81$

4. Determine the values of m and n if $\frac{\sqrt{27} + \sqrt{48}}{\sqrt{75}} = \frac{m}{n}$.

5. Determine the values of x and y if $\frac{2^{-1} + 3^{-1}}{2^{-2} + 3^0} = \frac{x}{y}$.

6. Solve for x if $\frac{2x-3}{x} - \frac{x}{x+3} = \frac{2-x}{1-x}$.

7. Simplify: $x^{\frac{3}{2}} - 16x^{\frac{3}{4}} + 64 = 0$

8. Given $(x) = \frac{\sqrt{x^2-4}}{3-x}$, determine the value(s) of x for which:

8.1 $f(x) = 0$

8.2 $f(x)$ is undefined.