AQA Level 2 FM Algebra IV

Section 5: Indices

Exercise

1. Find:

   (i) 3^4

   (ii) 2^6

   (iii) $4^{1/2}$

   (iv) $16^{-1/2}$

   (v) $8^{5/3}$

   (vi) $36^{-3/2}$

   (vii) $\left(\dfrac{1}{2}\right)^{-1}$

   (viii) $\left(\dfrac{25}{9}\right)^{-1/2}$

   (ix) $\left(\dfrac{27}{64}\right)^{-2/3}$

2. Simplify the following:

   (i) $3^{11} \times 3^{-4} \div 3^3$

   (ii) $\left(2^5\right)^3 \times \left(2^7\right)^{-2}$

   (iii) $\dfrac{5^6}{5^5 \times 5^3}$

3. Simplify:

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

   (ii) $\dfrac{3^5 \times 5^3}{\sqrt{81 \times 25}}$

4. Simplify the following:

   (i) $\dfrac{2^5 \times 4^{1/2}}{2}$

   (ii) $\left(3^5\right)^{3/2} \times 9^{-7/4}$

   (iii) $\sqrt{\dfrac{x^{4/3}}{x^{1/3} \times x^{8/3}}}$

5. Simplify:

   (i) $\dfrac{16x^{\frac{1}{2}}}{2^3 x^{-\frac{1}{2}}}$

   (ii) $\dfrac{x^{\frac{5}{4}} x^{-1}}{\sqrt[4]{x^3}}$

6. Simplify the following:

   (i) $3^{5/2} - 3^{1/2}$

   (ii) $2^{1/2} + 2^{3/2} + 2^{5/2}$

   (iii) $y^{1/2} - y^{-1/2}$

7. Simplify:

   (i) $\dfrac{2^{\frac{5}{2}} - 2^{\frac{3}{2}}}{2^{\frac{1}{2}}}$

   (ii) $\left(\dfrac{x^{\frac{7}{4}} - x^{\frac{3}{4}} + x \times x^{\frac{7}{4}}}{x^{\frac{1}{4}}}\right)^2$

   (iii) $\left[\dfrac{y^{\frac{1}{2}}}{x^{\frac{3}{4}}} - \dfrac{x^{\frac{5}{4}}}{y^{\frac{3}{2}}}\right]^4$

8. Solve the following equations

   (i) $x - 8\sqrt{x} + 15 = 0$ (ii) $\dfrac{1}{x^2} - \dfrac{1}{x} - 2 = 0$

9. Solve the following equations

   (i) $2^x = \dfrac{1}{4}$ (ii) $\left(\dfrac{1}{3}\right)^x = 27$ (iii) $25^x = \dfrac{1}{5}$