

## Surds [Ch. 2] + [Ch. 7]

- 1 Simplify  $\frac{(x^2)^{-2}}{x^{-3}}$ . [2]
- 2 (a) Simplify  $2x^{\frac{2}{3}} \times 3x^{-1}$ . [2]  
(b) Express  $2^{40} \times 4^{30}$  in the form  $2^n$ . [2]
- 3 Simplify  
(i)  $\frac{y^9 \times y^{-3}}{y^2}$ , [2]  
(ii)  $(\sqrt{t})^3 \times \sqrt{(t^5)}$ . [3]
- 4 (i) Given that  $81 = 3^x$ , write down the value of  $x$ . [1]  
(ii) Given that  $81^y = 3^{1-y}$ , find the value of  $y$ . [3]
- 5 Simplify  $\frac{x^{\frac{2}{3}}x^{\frac{1}{2}}}{x^{\frac{1}{6}}}$ . [3]
- 6 (i) Express  $(\frac{3}{4})^{-2}$  as an exact fraction in its simplest form. [2]  
(ii) Simplify  $\frac{(2\sqrt{x})^4}{8x}$ . [3]
- 7 A rectangle has sides of length  $(4 - \sqrt{5})$  cm and  $(3 + 2\sqrt{5})$  cm. Find the area of the rectangle, giving your answer in surd form as simply as possible. [4]
- 8 (a) Simplify  $\sqrt{(24)} + 7\sqrt{(54)}$ , giving your answer in simplified surd form. [3]  
(b) Given that  $\frac{8^n \times 2^{2n}}{4^{3n}} = 2^{kn}$ , find the value of  $k$ . [4]