

Year 12 Transition Work 2

1 Simplify these expressions.

a $\frac{x^3 \times x^4}{x^2}$ (1 mark)

b $(2x^3)^4$ (1 mark)

c $\frac{9x^{\frac{1}{2}}}{(27x^{-2})^{\frac{2}{3}}}$ (3 marks)

2 Solve $2x^2 \times 4x^4 = 512$ (2 marks)

3 Find the value of x .

$$x^{-\frac{4}{3}} = \frac{1}{256} \quad (2 \text{ marks})$$

4 a Write $\sqrt{240}$ in the form $a\sqrt{15}$, where a is an integer. (1 mark)

b Expand and simplify $(2 - \sqrt{3})(5 + 2\sqrt{3})$. (2 marks)

c Simplify $\frac{2 + \sqrt{5}}{3 - \sqrt{5}}$ giving your answer in the form $a + b\sqrt{c}$, where a , b and c are rational numbers. (3 marks)

5 The area of a triangle is given as $(7 + 3\sqrt{3}) \text{ cm}^2$.

The base of the triangle is $(5 - \sqrt{3}) \text{ cm}$, and the perpendicular height is $(p + q\sqrt{3}) \text{ cm}$.

Find the values of p and q . (4 marks)

6 Expand and simplify these expressions.

a $3(x - 2y)$ (1 mark)

b $(2x - 3)(3x + 5)$ (2 marks)

c $(x - 2)^2(x + 5)$ (3 marks)

7 Fully factorise these expressions.

a $2xy - 4x$ (1 mark)

b $x^2 + 2x - 3$ (1 mark)

8 Solve these equations.

a $3x - 7 = 17$

(1 mark)

b $x^2 - 6x + 5 = 0$

(2 marks)

c $2x^2 - 5x + 1 = 0$

(2 marks)

9 Solve these pairs of simultaneous equations.

a $2x + y = 7$

(3 marks)

$3x - y = 8$

b $y = 3x - 1$

(3 marks)

$3y = 6x + 1$

c $2x - y = 9$

(4 marks)

$x^2 + y^2 = 17$

10 Solve these inequalities.

a $7x - 6 \leq 8$

(1 mark)

b $3x + 2 \geq 7x - 4$

(2 marks)

c $x^2 + 12x - 28 > 0$

(2 marks)

11 The function f is defined as $f(x) = 5x + 2$

Find the value of $f(-4)$.

(1 mark)