

## Maths Transition Assignment

*Please write full solutions in the boxes provided and submit during your first lesson at Cowley.*

1. Simplify the following

a)  $(3a)^4$

b)  $(49x^{10})^{1/2}$

c)  $(9x^5) \div (1.5x^{-8})$

2. Factorise the following

a)  $x^2 - 4x - 21$

b)  $x^2 - 169$

c)  $8x^2 + 2x - 15$

3. Solve these equations

a)  $5x + 9 = 4 - 3x$

b)  $x^3 - 53 = 163$

c)  $\frac{5w + 3}{w - 2} = 6$

- d) 28m of fencing is arranged so that it encloses a rectangular area of  $40\text{m}^2$ . If  $w$  is the width of the rectangle then:
- Find the length of the rectangle in terms of  $w$ .
  - Form a quadratic equation involving  $w$ .
  - Solve this equation to find  $w$ .

e) Find two consecutive integers so that the sum of their squares is 61.

4. What is the 10<sup>th</sup> and the n<sup>th</sup> term of the following sequences:

a) 5, 9, 13, 17, ...

b)  $\frac{1}{3}, \frac{4}{5}, \frac{9}{7}, \frac{16}{9}, \dots$



5. a) Solve the simultaneous equations

$$\begin{aligned} 2y - 3x &= -14 \\ 2y + x &= 10 \end{aligned}$$

b) A stone is thrown into the air and its height,  $h$  metres above the ground, is given by the equation

$$h = at - bt^2$$

From an experiment we know that  $h = 40$  when  $t = 2$  and that  $h = 45$  when  $t = 3$ . Show that,

$$a - 2b = 20 \text{ and } a - 3b = 15$$

Solve these equations to find  $a$  and  $b$

6. Simplify the following surds

a)  $\sqrt{125}$

b)  $\sqrt{12} + \sqrt{27} + \sqrt{75}$

c)  $(3 + \sqrt{2})(5 + \sqrt{18})$

7. Evaluate

$$\frac{4.5 \times 10^{12}}{3 \times 10^{-6}}$$

leaving your answer in standard form.

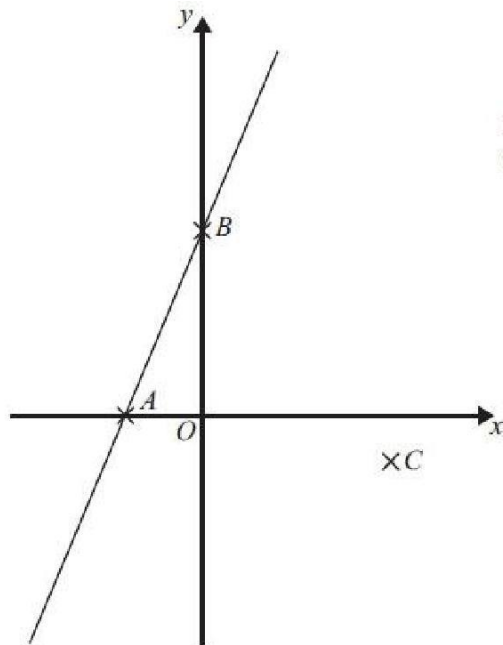
8. In the diagram below

A is the point  $(-2, 0)$

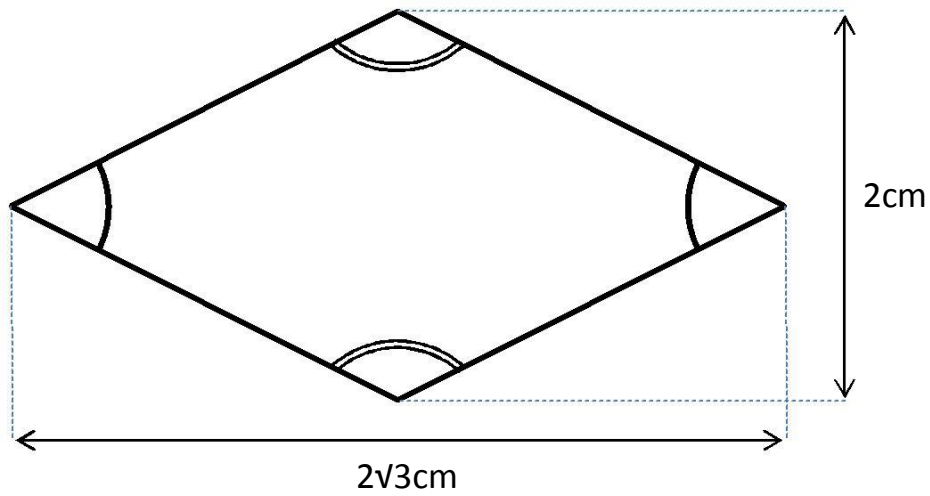
B is the point  $(0, 4)$

C is the point  $(5, -1)$

Find an equation of the line that passes through C and is perpendicular to AB.



9. Work out the perimeter and all of the angles in this diagram



10. The following formula gives distance  $s$ , in terms of acceleration  $a$ , speeds  $u$  and time  $t$ .

$$s = ut + \frac{at^2}{2}$$

- a) Find  $s$  when  $u = 5$ ,  $a = -3$  and  $t = 4$
- b) Rearrange the formula to make  $a$  the subject.