

A Level Maths Taster

Try to complete the questions below. You can look things up to try and help you solve them. We recommend www.mymaths.co.uk and www.drfrstmaths.com

When you've finished hand it in to Ms Townend or email it to atownend@ripleyacademy.org

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 40m^2 . If w is the width of the rectangle then:

- i) Find the length of the rectangle in terms of w .
- ii) Form a quadratic equation involving w .
- iii) Solve this equation to find w .

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

4. What is the 10th and the nth 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,

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

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

$$\frac{4.5 \times 10^{12}}{0.3 \times 10^{-6}}$$

leave your answer in standard form.

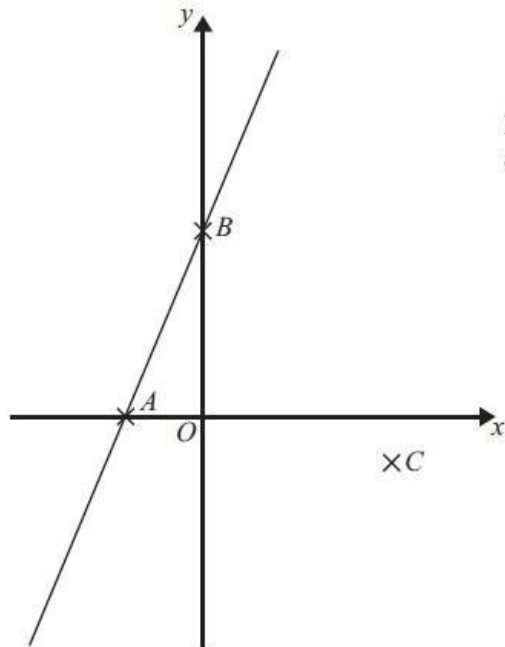
8. In the diagram below

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

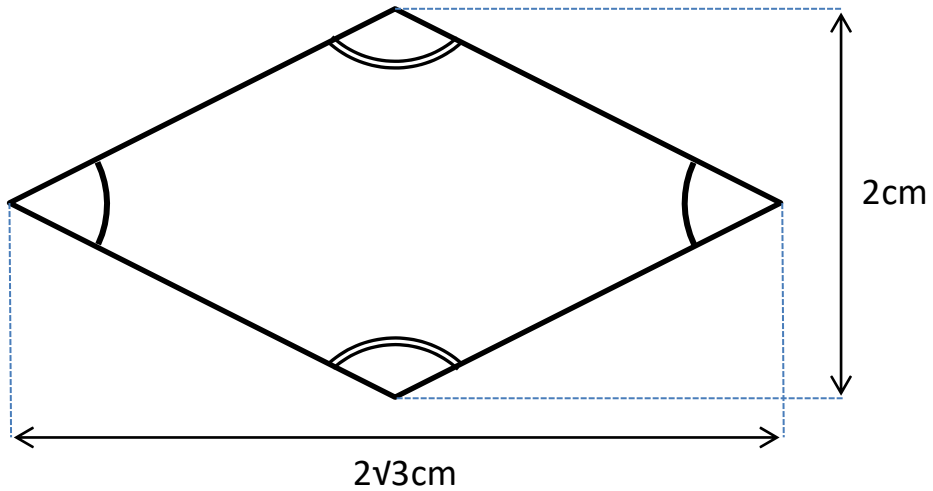
B is the point $(0, 4)$

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.