

Year 9 HW Due 31st Jan

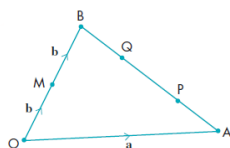
1. Solve the equation

- a) $\frac{f}{5} + 2 = 8$ b) $\frac{w}{3} - 5 = 2$ c) $\frac{x}{8} + 3 = 12$
- d) $\frac{6y + 3}{9} = 1$ e) $\frac{2x - 3}{5} = 4$ f) $2(d + 3) = d + 12$
- g) $m^2 + 10m + 25 = 0$ h) $t^2 - 8t + 16 = 0$ i) $13x^2 = 11 - 2x$

Solve, giving answers correct to 2d.p.

- j) $4x^2 - 9x + 4 = 0$ k) $7x^2 + 3x - 2 = 0$ l) $5x^2 - 10x + 1 = 0$

2.

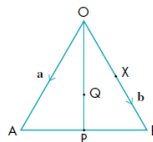


OAB is a triangle where M is the midpoint of OB. P and Q are points on AB such that $AP = PQ = QB$. $\vec{OA} = \mathbf{a}$ and $\vec{OB} = 2\mathbf{b}$

- a Find, in terms of \mathbf{a} and \mathbf{b} , expressions for these vectors.
- \vec{BA}
 - \vec{MQ}
 - \vec{OP}
- b What can you deduce about quadrilateral OMQP? Give a reason for your answer.

3.

In the triangle OAB, P is the midpoint of AB, X is the midpoint of OB, $\vec{OA} = \mathbf{a}$ and $\vec{OB} = \mathbf{b}$. Q is the point that divides OP in the ratio 2 : 1.

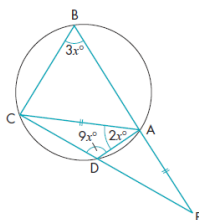


- a Express these vectors in terms of \mathbf{a} and \mathbf{b} .
- \vec{AB}
 - \vec{AP}
 - \vec{OP}
 - \vec{OQ}
 - \vec{AQ}
 - \vec{AX}
- b Deduce that $\vec{AX} = k\vec{AQ}$, where k is a scalar, and find the value of k .

4.

The diagram shows a cyclic quadrilateral ABCD. The straight lines BA and CD are extended and meet at E.

EA = AC.
 Angle ABC = $3x^\circ$.
 Angle ADC = $9x^\circ$.
 Angle DAC = $2x^\circ$.

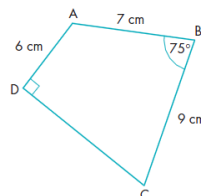


- Show that $x = 15$.
- Calculate the size of angle EAD.

AQA, Question 15, Paper 1 Higher, November 2003

5.

ABCD is a quadrilateral. AB = 7 cm, AD = 6 cm and BC = 9 cm. Angle ABC = 75° and angle ADC = 90° .



Calculate the perimeter of ABCD.

[Hint: try drawing in line AC to start you off]

6.

The diagram shows an ellipse of width $2a$ cm and height $2b$ cm.

One of the following is a formula for the area of the ellipse.

- Formula 1 $\pi(a + b)$
 Formula 2 πab
 Formula 3 $\pi a^2 b^2$

- What is the correct formula?
- Explain how you can tell that this formula is correct.

7.

Which of these are possible? If possible, give an example or diagram, if not, state why not.

- Two prime numbers, p and q , such that pq is an even number
- A regular polygon with interior angle 130 degrees.
- A triangle with side lengths 4 cm 6 cm and 11 cm
- A rectangle of area 20cm^2 , with side lengths x and $(8-x)$