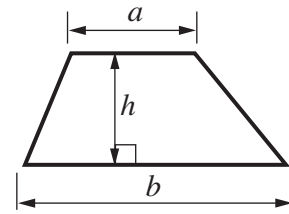
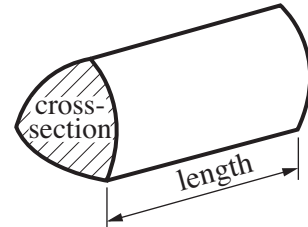


Formulae Sheet

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = (area of cross-section) \times length

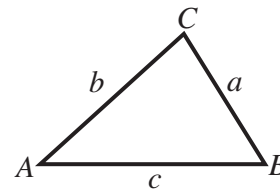


In any triangle ABC

Sine rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

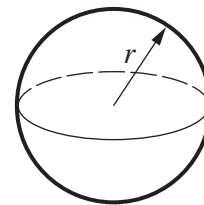
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2}ab \sin C$



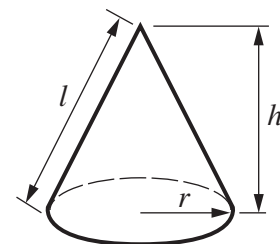
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$



Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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1 (a) Express each of these decimals as fractions.

(i) $0.\dot{6}$

(a)(i) [1]

(ii) $0.0\dot{6}$

(ii) [1]

(b) Hence, or otherwise, express $0.7\dot{6}$ as a fraction in its simplest form.

(b) [2]

2 (a) Simplify.

$$\frac{6x^2 + 2x}{4x}$$

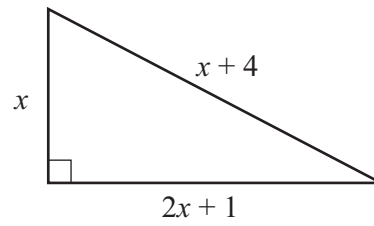
(a) [2]

(b) Write as a single fraction.
Simplify your answer.

$$\frac{3}{x} + \frac{7}{x+2}$$

(b) [2]

- 3 The diagram shows a right-angled triangle.
All lengths are in centimetres.



Not to scale

- (a) Use Pythagoras' theorem to show that $4x^2 - 4x - 15 = 0$.

[2]

- (b) Hence find the length of the shortest side of the triangle.

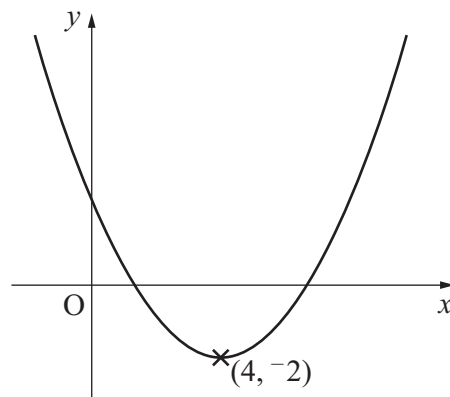
(b) cm [3]

- 4 Simplify, giving your answer in the form $a + b\sqrt{3}$.

$$\frac{12 + \sqrt{3}}{\sqrt{3}}$$

..... [2]

- 5 This is a sketch of $y = f(x)$.



Not to scale

The minimum point of the graph is $(4, -2)$.

Write down the coordinates of the minimum point for each of the following graphs.

(a) $y = f(x + 3)$

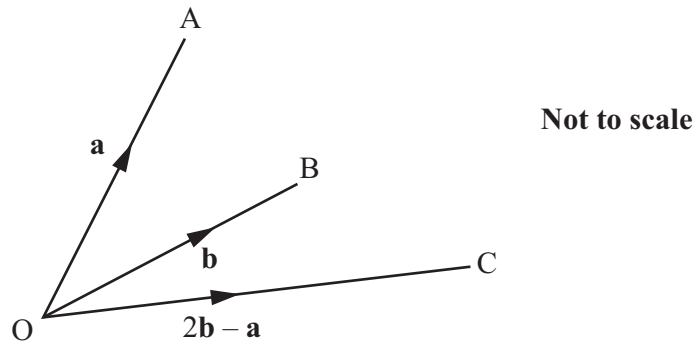
(a) (..... ,) [1]

(b) $y = f(x) + 3$

(b) (..... ,) [1]

(c) $y = 3f(x)$

(c) (..... ,) [1]



In the diagram,

$$\vec{OA} = \mathbf{a}, \vec{OB} = \mathbf{b}, \vec{OC} = 2\mathbf{b} - \mathbf{a}.$$

(a) Find the following vectors in terms of **a** and **b**.

(i) \vec{AB}

(a)(i) [1]

(ii) \vec{AC}

(ii) [1]

(b) What can you deduce about the points A, B and C?

.....

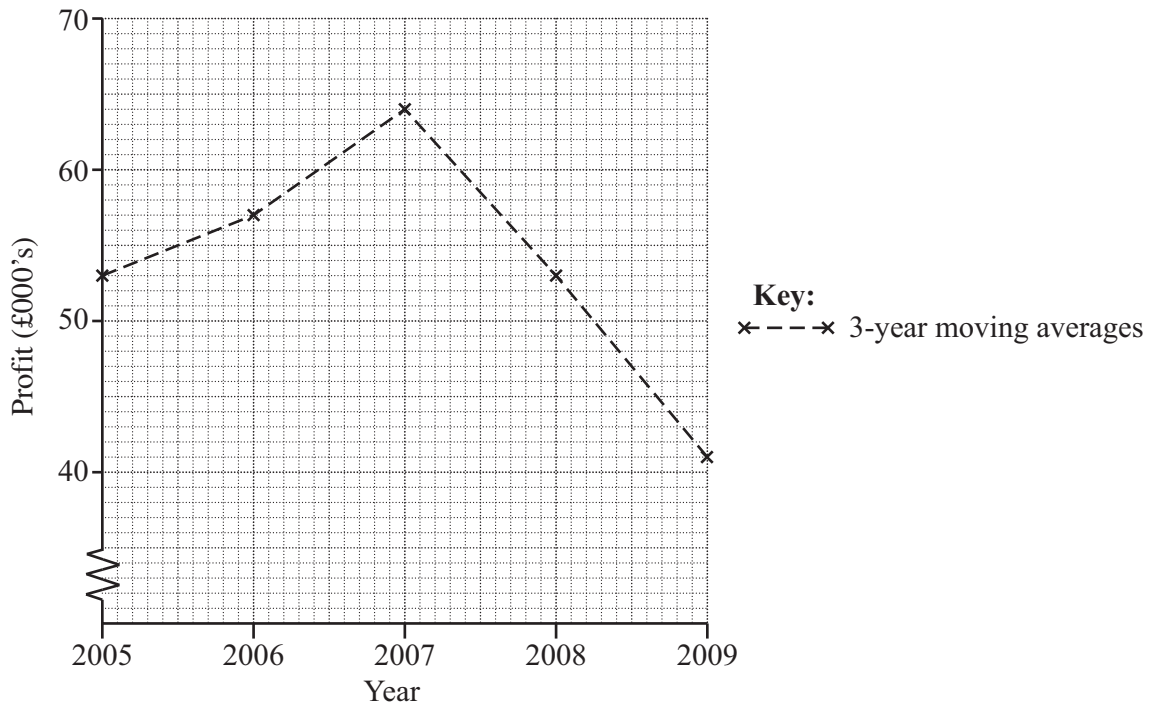
.....

.....

..... [2]

TURN OVER FOR QUESTION 7

- 7 A company sells garden furniture.
The graph shows the 3-year moving averages for the company's profits.



In 2009 the company made a profit of £29 000.
In 2010 the company made a profit of £36 000.

Use the graph to help you work out the profit the company made in 2008.

£ [3]

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