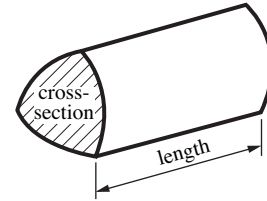


Formulae Sheet

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

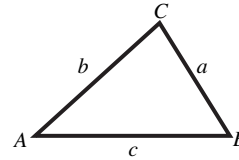


In any triangle ABC

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

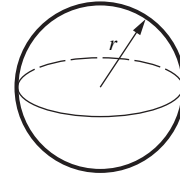
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



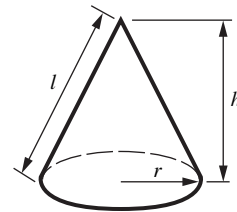
Volume of sphere = $\frac{4}{3} \pi r^3$

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

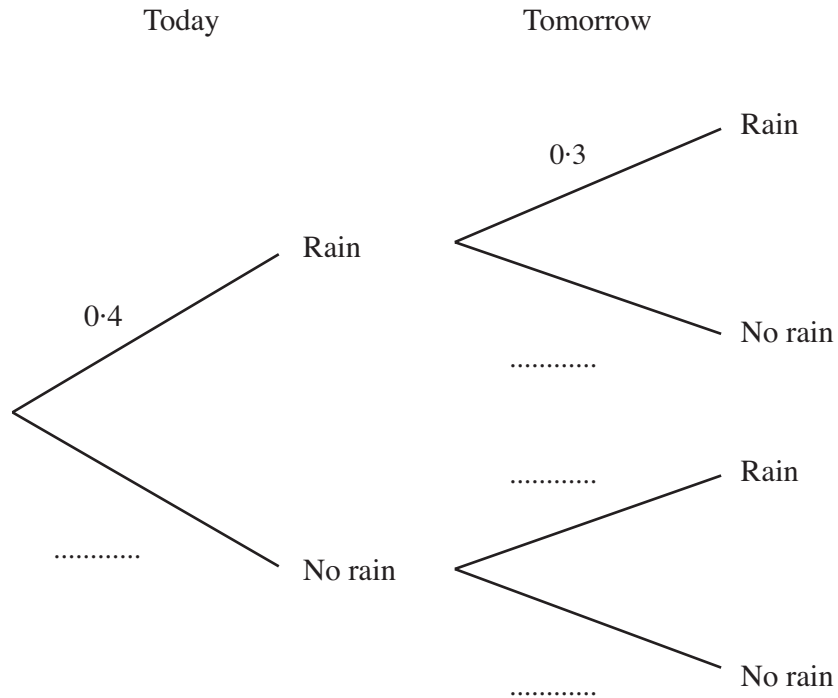
The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by

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

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- 1 The weather forecast for today says there is a 40% chance of rain.
The weather forecast for tomorrow says there is a 30% chance of rain.
Assume these events are independent.

(a) Complete the tree diagram.



[2]

(b) Calculate the probability of **no** rain on **both** days.

(b) [2]

4	
---	--

2 Work out.

(a) 3^{-2}

(a) [1]

(b) $8^{\frac{1}{3}}$

(b) [1]

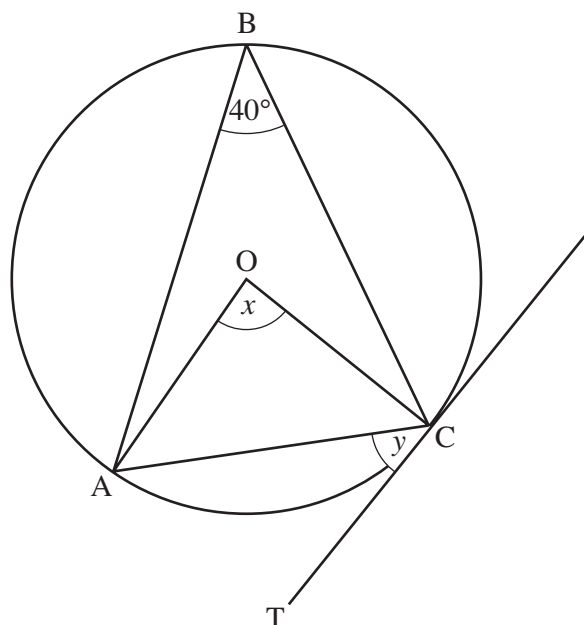
2	

- 3 When she was born Lily weighed 3 kg, correct to the nearest kilogram.
When she was three months old Lily weighed 6 kg, correct to the nearest kilogram.

What is the upper bound of the weight she has gained?

..... kg [2]

2	



Not to
scale

A, B and C are points on the circle, centre O.
CT is the tangent to the circle at C.
Angle $ABC = 40^\circ$.

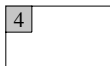
Find angle x and angle y .
Give a reason for each of your answers.

$x = \dots\dots\dots^\circ$ because $\dots\dots\dots$

$\dots\dots\dots$ [2]

$y = \dots\dots\dots^\circ$ because $\dots\dots\dots$

$\dots\dots\dots$ [2]



5 (a) Factorise.

$$3ab + 15b^2$$

(a) [2]

(b) Simplify.

$$\frac{x^2 - 6x - 7}{x + 1}$$

(b) [3]

5

6 Sam and Michael are comparing their homework.

Sam

$$(3.2 \times 10^2) \times (9.5 \times 10^{-3}) = 304$$

Michael

$$(3.2 \times 10^2) \times (9.5 \times 10^{-3}) = 3.04$$

Who has the correct answer?

Use **estimation** to show how you decide.

Show clearly the values you use.

..... is right because the correct answer is approximately

..... [3]

3

7 It is given that

$$y \propto \frac{1}{x^2}$$

and $y = 9$ when $x = 2$.

(a) Find a formula connecting y and x .

(a) [2]

(b) Calculate y when $x = 10$.

(b) [1]

(c) Calculate the values of x when $y = 4$.

(c) and [2]

5	

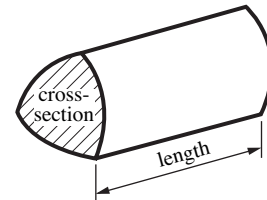
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Formulae Sheet

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

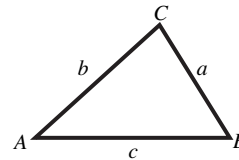


In any triangle ABC

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

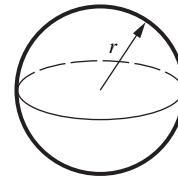
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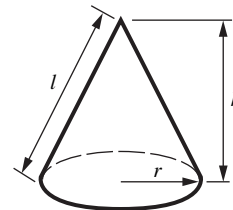
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The Quadratic Equation

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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- 8 (a) Rearrange this formula to make y the subject.

$$3(x - 5y) = y - 2$$

(a) [3]

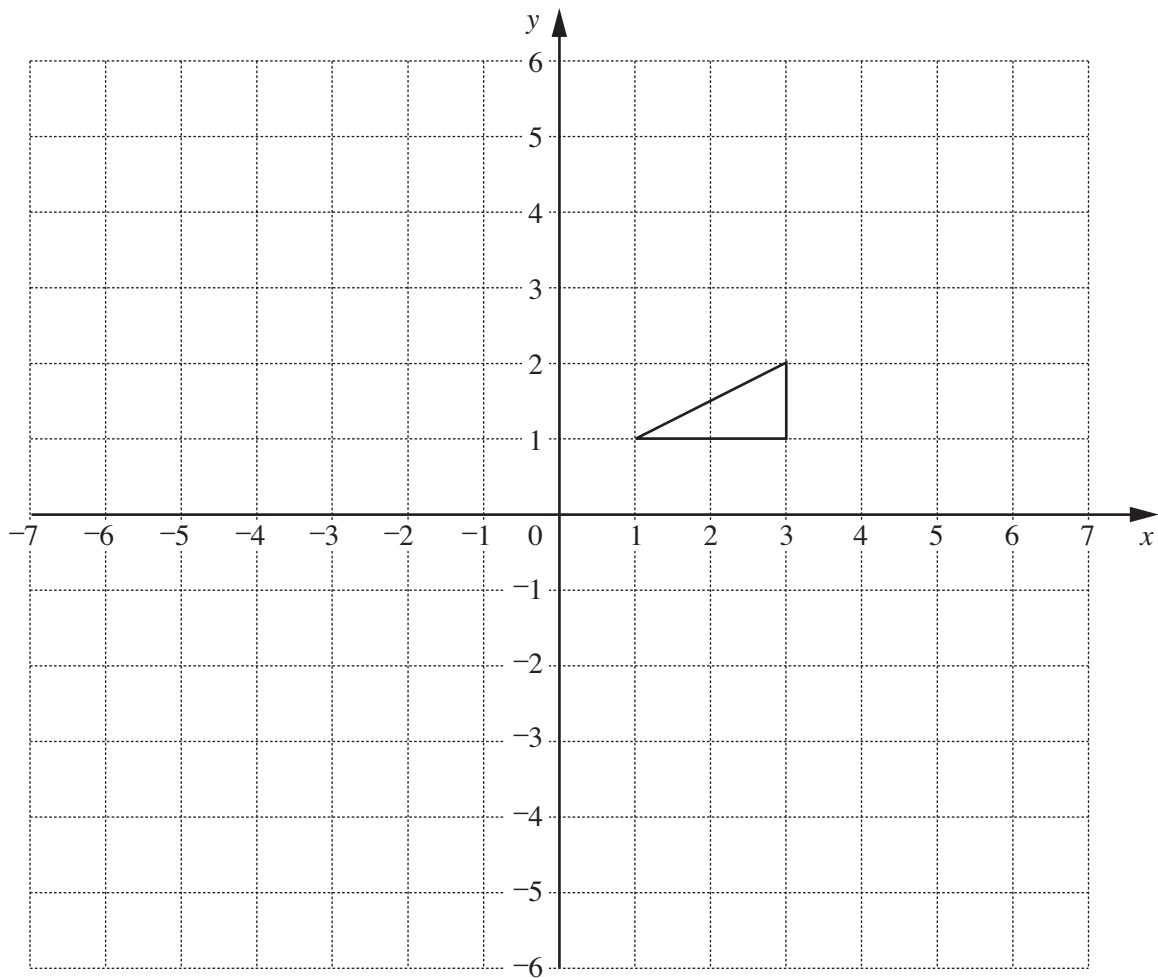
- (b) Expand and simplify.

$$(2x + 5)(x - 2)$$

(b) [3]

6

9

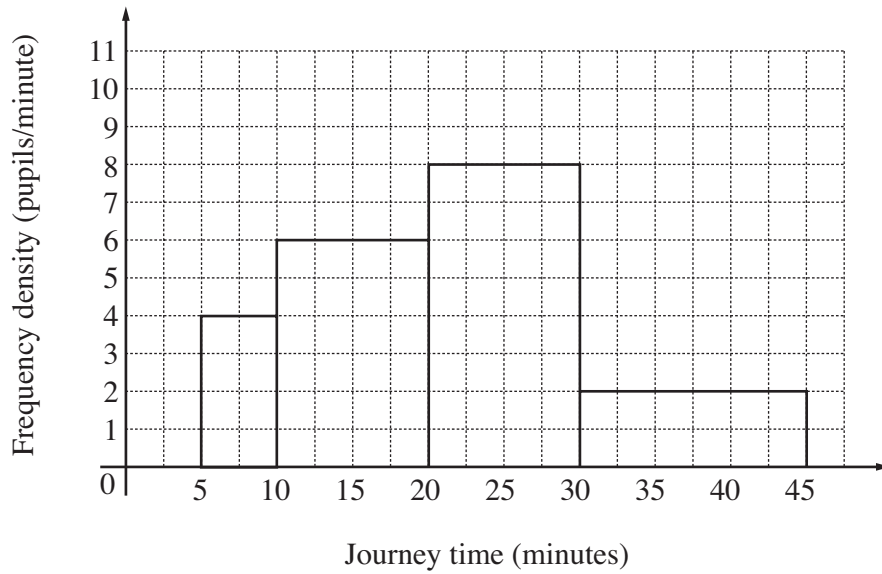


Enlarge the triangle with scale factor -2 from centre 0 .

[2]

2

- 10** This histogram shows the distribution of journey times for pupils travelling to school.



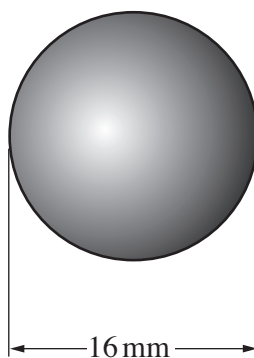
- (a)** How many pupils had a journey time of between 10 and 20 minutes?

(a) [1]

- (b)** What percentage of pupils have a journey time of between 10 and 20 minutes?

(b)% [2]

3



A Tastyfruit sweet is a sphere with diameter 16 mm.

(a) Calculate the volume of one Tastyfruit sweet.

(a) mm³ [2]

(b) A Superfruit sweet has twice the volume of a Tastyfruit sweet.

Calculate the diameter of a Superfruit sweet.

(b) mm [2]

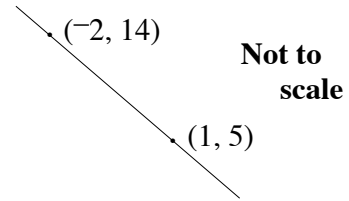
4

- 12 (a)** Find the gradient of a line which is perpendicular to the line $y = 2x + 1$.

(a) [1]

- (b)** A line passes through the points $(-2, 14)$ and $(1, 5)$.

- (i)** Find the gradient of this line.

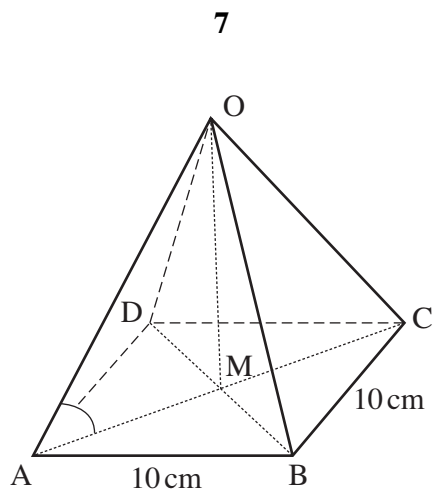


(b)(i) [2]

- (ii)** Find the equation of this line.
Give your answer in the form $y = mx + c$.

(ii) [2]

5



OABCD is a square-based pyramid.

The vertex, O, is vertically above M, the centre of the base.

$AB = 10\text{ cm}$, $OM = 12\text{ cm}$.

Calculate angle OAM.

.....° [5]

5	
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