

Name: _____

GCSE Maths Practice Paper
CCEA Unit M8
Set A
Paper 2 - Calculator



Corbettmaths

Equipment

1. A black ink ball-point pen.
2. A pencil.
3. An eraser.
4. A ruler.
5. A pair of compasses.
6. A protractor.
7. A calculator

Guidance

1. Read each question carefully.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

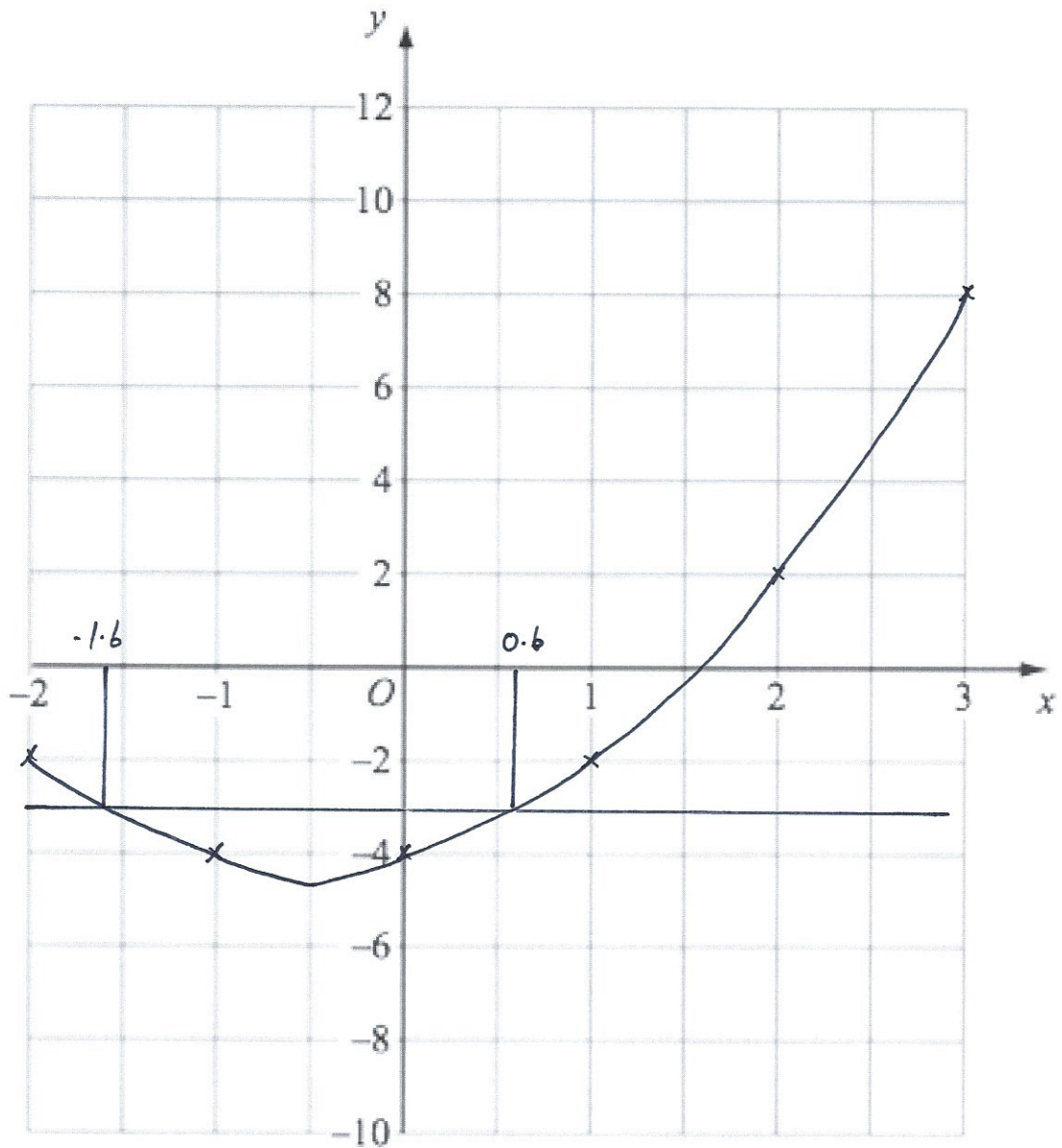
Question	Mark	Available
1		4
2		2
3		2
4		4
5		3
6		2
7		2
8		4
9		5
10		4
11		5
12		4
13		5
14		4
Total		50

Information

1. Time: 1 hour 15 minutes
2. The maximum mark for this paper is 50.
3. The marks for questions are shown in brackets
4. You may use tracing paper.

1. (a) Draw the graph of $y = x^2 + x - 4$ for the values of x from -2 to 3.

x	-2	-1	0	1	2	3
y	-2	-4	-4	-2	2	8



(3)

(b) Use your graph to find estimates of the solutions to the equation $x^2 + x - 4 = -3$

$x = -1.6$ or $x = 0.6$

(1)

2. A sequence of numbers is shown.

5 8 11 14 17
3_n 3 6 9

Find an expression for the n th term of the sequence.

$$3n + 2$$

(2)

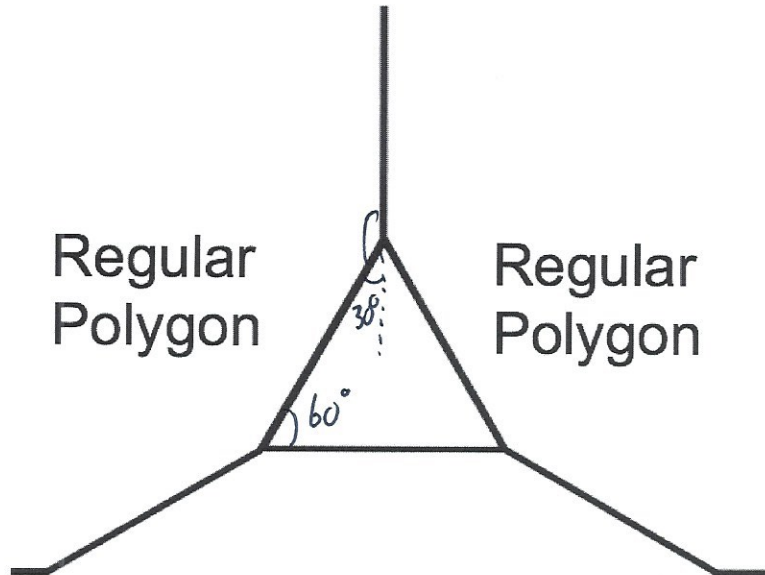
3. Simplify $(5w^7)^3$

$$125w^{21}$$

(2)

4.

Shown below are two identical regular polygons and an equilateral triangle.



Calculate the number of sides each regular polygon has.

$$180 \div 3 = 60^\circ$$

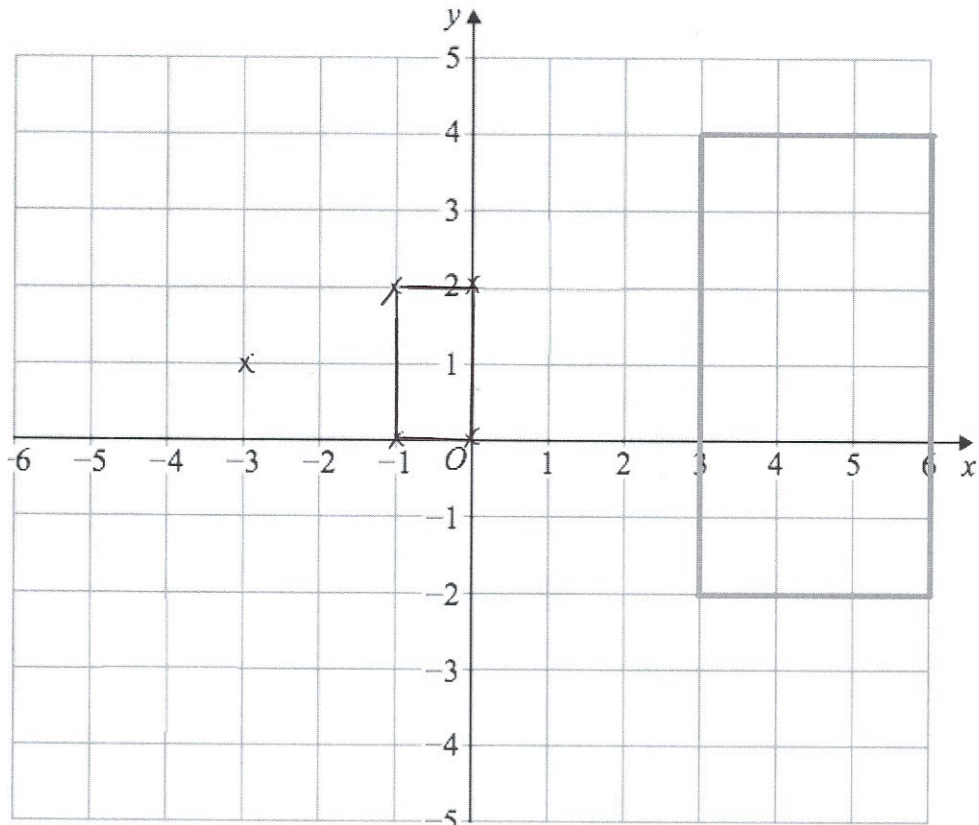
$$180 - 30^\circ = 150^\circ \text{ (interior)}$$

$$30^\circ \text{ (exterior)}$$

$$360 \div 30 = 12$$

12 sides
(4)

5.

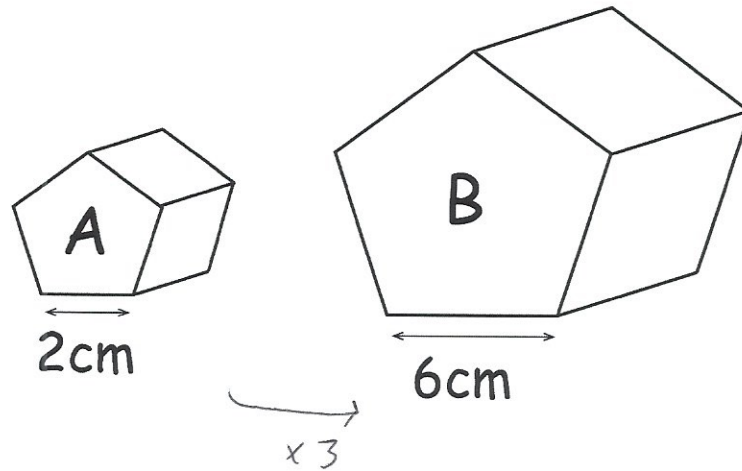


Draw the enlargement of the rectangle with scale factor $\frac{1}{3}$ and centre of enlargement $(-3, 1)$.

(3)

6.

Shown below are two similar prisms, A and B.



The volume of prism A is 37.5cm^3

Work out the volume of prism B.

$$6 \div 2 = 3$$

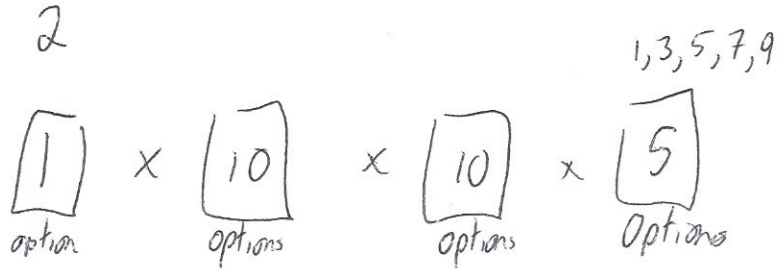
$$37.5 \times 3^3$$

$$\underline{\hspace{1cm}1012.5\hspace{1cm}}\text{cm}^3$$

(2)

7. Megan creates a 4-digit code for her debit card.
 The first digit is 2
 The 4-digit code is **odd**.

How many possible codes are there?



500

(2)

8. Trevor is taking part in a quiz.
 The probability that he answer a question correctly is $\frac{3}{5}$

Trevor is asked two questions.

- (a) Calculate the probability that Trevor answers both questions correctly.

$$\frac{3}{5} \times \frac{3}{5}$$

$$\frac{9}{25}$$

(2)

- (b) Calculate the probability that Trevor answers both questions incorrectly.

$$\frac{2}{5} \times \frac{2}{5} = \frac{4}{25}$$

$$\frac{4}{25}$$

(2)

9.

C is directly proportional to the square root of y.
When $C = 12.8$, $y = 16$.

(a) Express C in terms of y.

$$C \propto \sqrt{y}$$

$$C = k \times \sqrt{y}$$

$$12.8 = k \times \sqrt{16}$$

$$12.8 = k \times 4$$

$$k = 3.2$$

$$C = \frac{3.2 \sqrt{y}}{(3)}$$

(b) Find y when $C = 464$

$$464 = 3.2 \sqrt{y}$$

$$\sqrt{y} = 145$$

$$y = \frac{21025}{(2)}$$

10. The number of penguins inhabiting an island, P , at the start of Year 1 is 5000. Each year, the number of penguins increases by 6%.

- (a) Write a formula for P , in terms of n , for the number of penguins inhabiting the island in Year n .

$$P = 5000 \times 1.06^n$$

or

$$P = 5000(1.06)^n$$

$$P = \frac{5000(1.06)^n}{(2)}$$

- (b) Calculate the number of penguins inhabiting the island in Year 5. Give your answer to the nearest 100.

$$5000 \times 1.06^5 = 6312.3848$$

$$\frac{6300}{(2)}$$

11. Two ships, A and B, leave a port at midday.

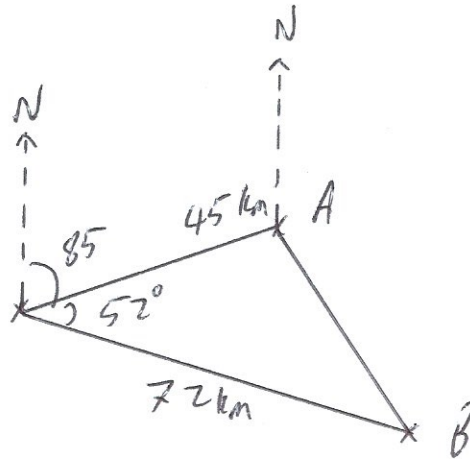
Ship A travelled on a bearing of 085° at a speed of 15km/h

$$3 \times 15 = 45 \text{ km}$$

Ship B travelled on a bearing of 137° at a speed of 24km/h

$$3 \times 24 = 72 \text{ km}$$

How far apart are ships A and B at 15:00?



$$AB^2 = 45^2 + 72^2 - 2 \times 45 \times 72 \times \cos 52$$

$$AB^2 = 3219.51364$$

$$\dots\dots\dots$$
$$56.74 \text{ km}$$

(5)

12. Solve the simultaneous equations

$$y = x + 3$$

$$x^2 + y^2 = 149$$

$$x^2 + (x+3)^2 = 149$$

$$x^2 + x^2 + 6x + 9 = 149$$

$$2x^2 + 6x - 140 = 0$$

$$x^2 + 3x - 70 = 0$$

$$(x+10)(x-7) = 0$$

$$x = -10 \quad \text{or} \quad x = 7$$

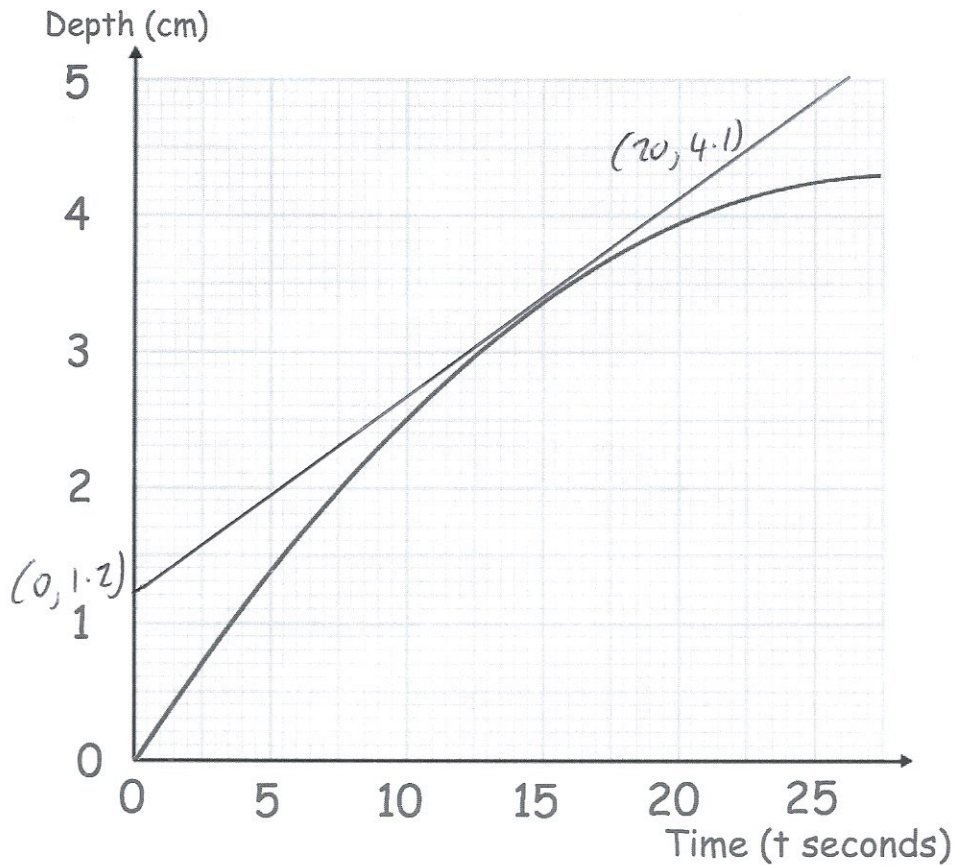
$$y = -7 \quad \text{or} \quad y = 10$$

$$x = -10 \quad \text{or} \quad x = 7$$
$$y = -7 \quad \text{or} \quad y = 10$$

.....
(4)

13. Jack is filling a container with water.

The graph shows the depth of the water, in centimetres, t seconds after the start of filling the container.



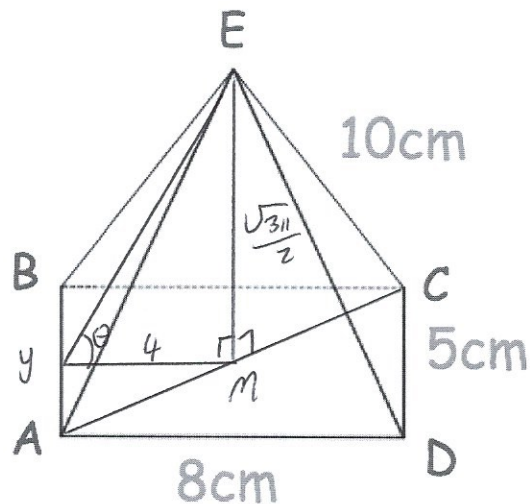
(a) Calculate an estimate for the gradient of the graph when $t = 15$ seconds.

$$\frac{4.1 - 1.2}{20 - 0} = 0.145 \quad \underline{\underline{0.145 \text{ cm/s}}} \quad (3)$$

(b) Describe fully what your answer to (a) represents

the rate at which the depth of water is increasing each second = 0.145 cm increase in depth every second, when $t=15$. (2)

14. Shown below is a rectangular based pyramid.
The apex E is directly over the centre of the base.



$$\begin{aligned} AD &= 8\text{cm} \\ CD &= 5\text{cm} \\ CE &= 10\text{cm} \end{aligned}$$

Calculate angle between the face ABE and the base ABCD

$$AC^2 = 5^2 + 8^2$$

$$AC^2 = 89$$

$$AC = \sqrt{89}$$

$$MC = \frac{1}{2} \sqrt{89}$$

$$EC^2 = MC^2 + EM^2$$

$$100 = \frac{89}{4} + EM^2$$

$$EM^2 = \frac{311}{4}$$

$$EM = \frac{\sqrt{311}}{2}$$

$$\tan \theta = \frac{\frac{\sqrt{311}}{2}}{4}$$

$$\tan \theta = \frac{\sqrt{311}}{8}$$

$$\theta = 65.6$$

$$\begin{array}{r} 65.6 \\ \hline \end{array} \circ$$

(4)