# **GCSE Homework Booklet 4**

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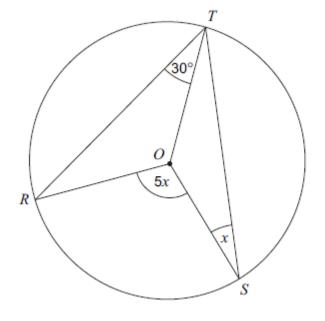
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### **Circle Theorems**

Q1.

R, S and T are on the circumference of a circle, centre O.



Not drawn accurately

(a) Give a reason why angle OTS = x

(1)		

(b) Work out the value of X.


Answer\_\_\_\_\_degrees

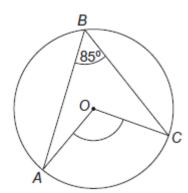
(Total 4 marks)

(3)

Q2.

(a) The diagram shows a circle, centre O.

Not drawn accurately

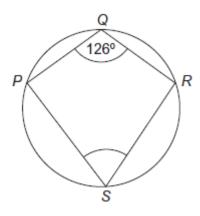


Work out the size of angle *AOC*. Give a reason for your answer.

	Answer	degrees
Reason		

(b) P, Q, R and S are points on the circumference of a circle.

Not drawn accurately



Work out the size of angle *PSR*. Give a reason for your answer.

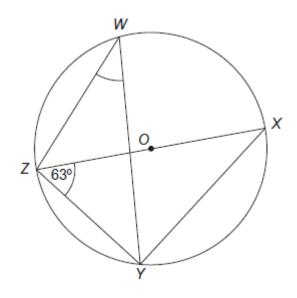
	Answer	degrees
Reason		

(2)

(2)

(c) W, Y, X and Z are points on the circumference of a circle centre O. ZX is a diameter. Angle  $YZX = 63^{\circ}$ 

Not drawn accurately

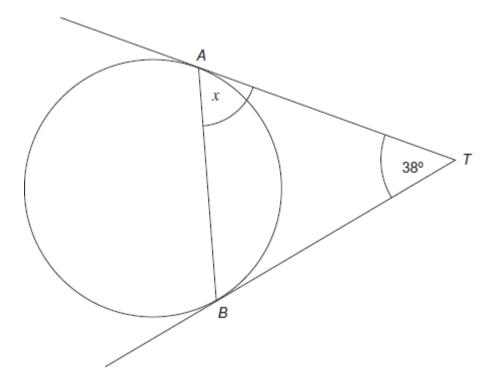


(Total 6 marks)

Q3.

(a) AB is a chord of the circle.
TA and TB are tangents to the circle.

Not drawn accurately

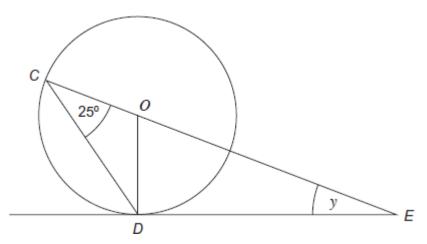


Work out the size of angle <i>X</i> .		
	Answer	degrees

(2)

(b) The diagram shows a circle, centre O.C and D are points on the circumference.COE is a straight line.DE is a tangent.

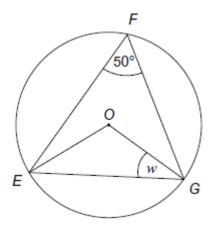
Not drawn accurately



> (3) (Total 5 marks)

(a) E, F and G are points on a circle, centre O.

Not drawn accurately



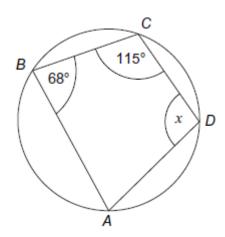
Work out the size of angle W.

 Answer	degrees	
	_ a.g	(2)

(b) A, B, C and D are points on the circumference of the circle.

Not drawn accurately

(2)



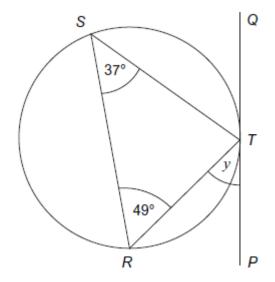
Work out the size of angle X.

Give a reason for your answer.

	Answer	aegrees
Reason		

(c) PTQ is a tangent to the circle.

*R*, *S* and *T* are points on the circle.



Write down the size of angle y.

Give a reason for your answer.

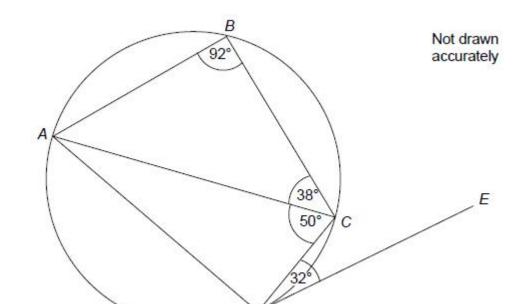
	Answer _		_ degrees	
Reason		 	 	
				(2)

(Total 6 marks)

## Q5.

A, B, C and D are points on a circle.

Angle  $ABC = 92^{\circ}$ Angle  $ACB = 38^{\circ}$ Angle  $ACD = 50^{\circ}$ Angle  $CDE = 32^{\circ}$ 



Tick whether each statement is true or false. Give a reason for each answer.

Statement

Statement	True False	
AC is a diameter		
Statement	True False	
Angle <i>ADC</i> = 88°		
Aligie ADO - 00		

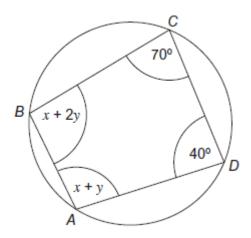
**False** 

True

Rea	ason	
Sta	atement True False	
DE	E is a tangent to the circle	
Rea	ason	
		(Total 4 ma
	nts A, B, C and D are on the circumference of the ci	ircle.
Poir	nts $A$ , $B$ , $C$ and $D$ are on the circumference of the ci $E$ is a straight line.	ircle. Not drawn accurately
Poir		
Poir	E is a straight line.	
Poir	E is a straight line.	
Poir	E is a straight line.	
Poir	E is a straight line.	Not drawn accurately
Poir	E is a straight line.	Not drawn accurately
Poir	E is a straight line.  **Box Straight line of angle BCD.**  **Box Straight line of an	Not drawn accurately
Poir <i>CDI</i>	E is a straight line.  Work out the size of angle BCD.  Give a reason for your answer.	Not drawn accurately
Poir <i>CDI</i>	E is a straight line.  Work out the size of angle BCD. Give a reason for your answer.  Answer	Not drawn accurately
Poir <i>CDI</i>	E is a straight line.  Work out the size of angle BCD.  Give a reason for your answer.	Not drawn accurately

ABCD is a cyclic quadrilateral.

Not drawn accurately



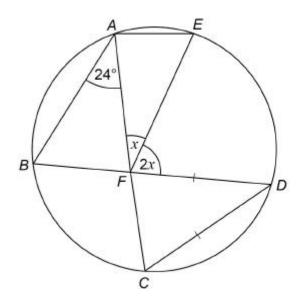
Work out X and Y.		
- <u></u>		
	X =	degrees
	<i>y</i> =	degrees
		(Total 4 marks)

0	Ω
w	O.

A, B, C, D and E are points on a circle.

BFD and AFC are straight lines.

DC = DF



Not drawn accurately

Work out the size of angle x.

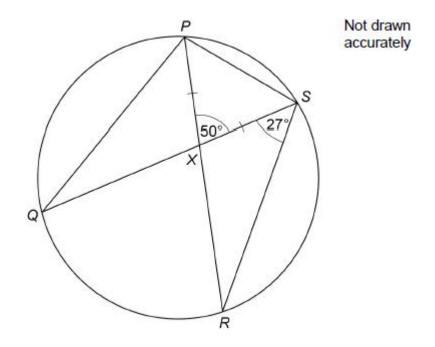
You <b>must</b> show your working which may be on the diagram.		
	<del></del>	
Answer		
	(Total 4 marks	

O	9
•	•

P, Q, R and S are points on a circle.

PXR and QXS are straight lines.

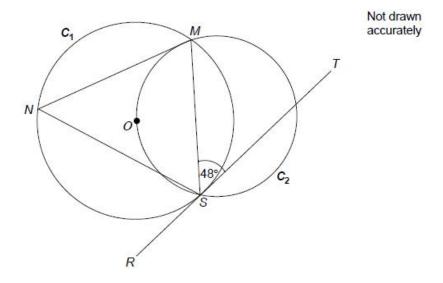
PX = SX



Prove that QS is <b>not</b> a diameter of the circle.				

(Total 4 marks)

M, N and S are points on circle  $C_1$  RST is a tangent to  $C_1$  Circle  $C_2$  passes through the centre O, S and M of circle  $C_1$ 



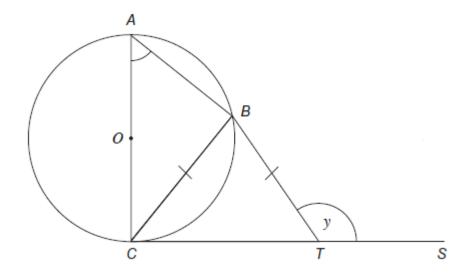
Prove that $SM$ is <b>not</b> a diameter of circle $C_2$ Give reasons for your answer.				

(3)

### Q11.

AC is a diameter of a circle, centre O. CTS is a tangent to the circle. B is a point on the circumference of the circle such that BC = BT Angle BTS = y

Not drawn accurately



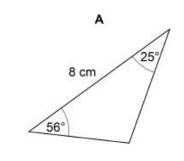
You are given that angle ACB = 20°	
Work out the value of <i>y</i> . You <b>must</b> show your working which may be on the diagram.	

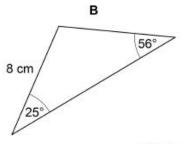
Answer \_\_\_\_\_ degrees

## **Similarity and Congruence**

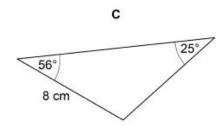
#### Q1.

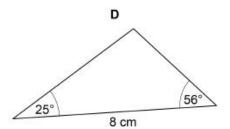
Here are four triangles.





Not drawn accurately





Which two triangles are congruent?

Circle two letters below.

Α

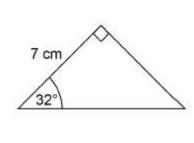
В

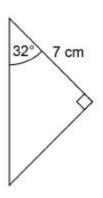
С

D

(Total 1 mark)

Q2.





Not drawn accurately

Circle the reason why these triangles are congruent.

SSS

SAS

ASA

**RHS** 

(Total 1 mark)

### Q3.

A and B are similar shapes.

B is an enlargement of A with scale factor 1.5

Α	Not drawn accurately
54° w	9 cm
Work out the values of $x$ , $h$ and $w$ .	

X =	degrees
h =	cm
W =	cm
	(Total 3 marks)

### Q4.

Which of these is **not** used to prove that triangles are congruent?

Circle your answer.

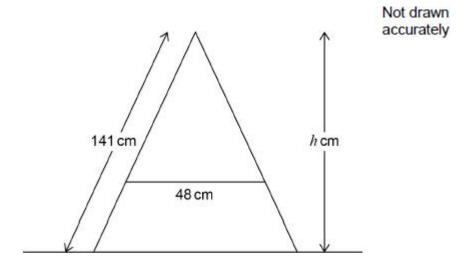
SSS SAS AAA RHS (Total 1 mark)

## Q5.

The diagram shows the side view of a step ladder with a horizontal strut of length 48 cm.

The strut is one third of the way up the ladder.

The symmetrical cross section of the ladder shows two similar triangles.



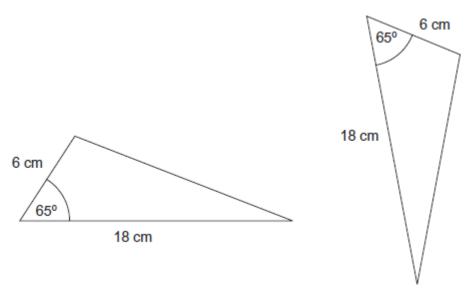
Work out the vertical height, $h$ cm, of the ladder.		
Answer	cm	
<del></del>	(Total 5 mark	

(Total 5 marks)

### Q6.

(a) These triangles are congruent.

Not drawn accurately



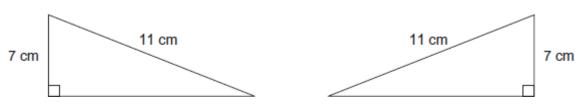
State the condition they satisfy.

Answer \_\_\_\_\_

(1)

(b) These triangles are congruent.

Not drawn accurately



State the condition they satisfy.

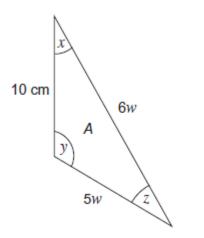
Answer \_\_\_\_\_

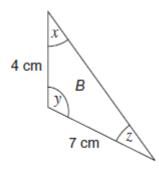
(Total 2 marks)

(1)

A and B are similar triangles.

Not drawn accurately





(a) Circle the scale factor from A to B.

$$\frac{5}{2}$$

(1	)

(b) Work out the perimeter of triangle *B*.

Answer	cm

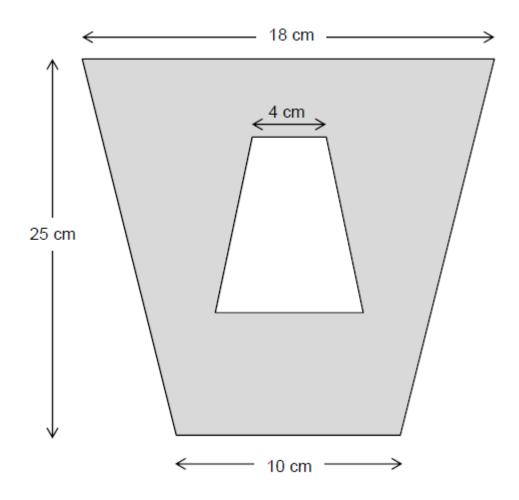
(4)

(Total 5 marks)

## Q8.

(a) A pattern is made from two **similar** trapeziums.

Not drawn accurately



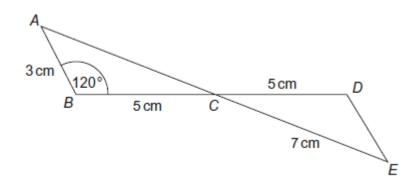
Show that the shaded area is 294 cm <sup>2</sup>				

## Q9.

The straight lines AE and BD intersect at C.

Not drawn accurately

(Total 5 marks)



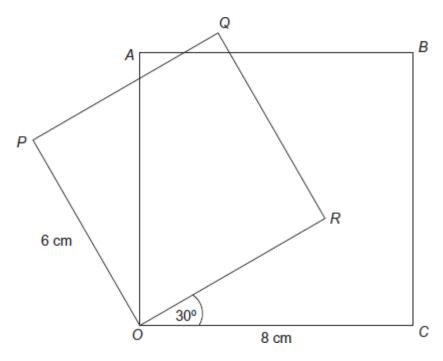
Prove that triangles ABC and EDC are congruent.				

## Q10.

OABC is a square of side 8 cm OPQR is a square of side 6 cm Angle ROC is 30°

Not drawn accurately

(Total 4 marks)



Prove that triangle ORC and triangle OPA are congruent.				

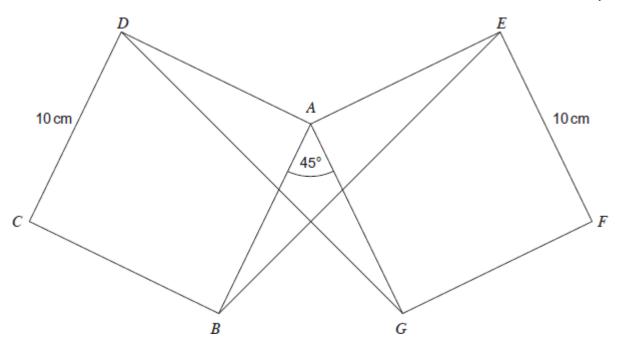
## Q11.

ABCD and AEFG are identical squares.

CD = EF = 10 cm

Angle  $BAG = 45^{\circ}$ 

Not drawn accurately



Prove that triangles AGD and ABE are congruent.					

(Total 4 marks)

## Similar Area and Volume

## Q1.

A and B are **similar** solids.

Solid	length (cm)
А	1
В	21

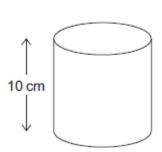
Alex	says,		
	"The volum	e of B is doubl	e the volume of A
	because the	e length of B is	double the lengtl
Is he	correct?		
Tick	a box.		
	Yes		No
Give	a reason for	your answer.	

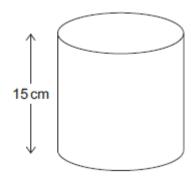
(Total 1 mark)

## Q2.

A solid cylinder has a volume of 454 cm<sup>3</sup>. The cylinder has a height of 10 cm.

A similar cylinder has a height of 15 cm.

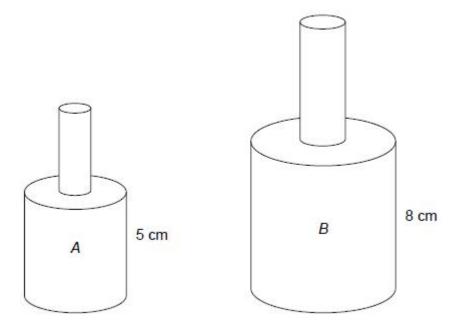




(Total 3 marks)

Answer	cm <sup>3</sup>
	<u>.</u>
What is the volume of the larger cylinder?	

Here are two similar solids,  $\boldsymbol{A}$  and  $\boldsymbol{B}$ .



The volume of B is 400 cm<sup>3</sup>

Is the volume of $A$ approximately one quarter of the volume of B? You <b>must</b> show your working.			
Answer			

## Q4.

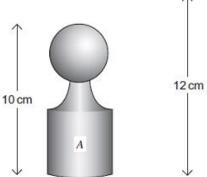
The diagram shows two pieces of glass.

	Not drawn accurately
← 50 cm →	← 75 cm →
The pieces are similar. The area of the small piece is 6000 cm <sup>2</sup> Glass costs £80 per square metre.	
Work out the cost of the large piece.	
• .	
Answer £ _	

(Total 5 marks)

#### Q5.

A and B are two similar solids.



The volume of A is 500 cm³.

Work out the volume of B.

Answer \_\_\_\_\_\_\_cm³
(Total 3 marks)

#### Q6.

Solids X and Y are similar.

X has volume 64 cm<sup>3</sup>

Y has volume 343 cm<sup>3</sup>

The surface area of X is 176  $\mbox{cm}^2$ 

Work out the surface area of Y.

Answer = \_\_\_\_\_ cm<sup>2</sup>

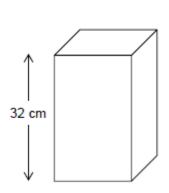
(Total 3 marks)

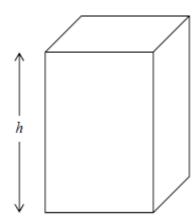
## Q7.

Two boxes are made with card.

The boxes are similar cuboids.

The smaller box has height 32 cm





It takes 44% more card to make the larger box.

Work out the height, <i>h</i> ,	of the larger box.		
			-

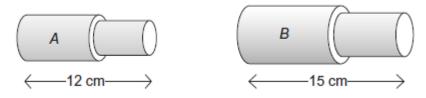
Answer \_\_\_\_\_ cm

(Total 4 marks)

#### **Q8.**

These two solid shapes are similar.

Not drawn accurately



The volume of A is 1400 cm<sup>3</sup>

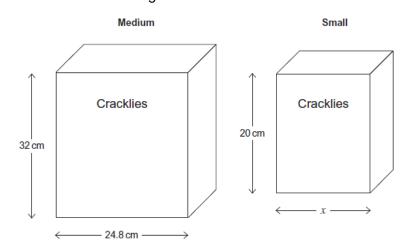
Work out the volume of B.		

Answer	cm <sup>3</sup>
	(Total 3 marks

## Q9.

Two boxes of cereal are shown.

The boxes are similar cuboids of heights 32 cm and 20 cm



ox.
_

(3)

\_ cm

(b)	A large box of cereal is a similar cuboid to the medium box. The large box has height 37 cm
	It is claimed that the large box has a volume 50% larger than the medium box.
	Is this claim true? You <b>must</b> show your working.
	(3) (Total 6 marks

## Q10.

Prisms A and B are similar.

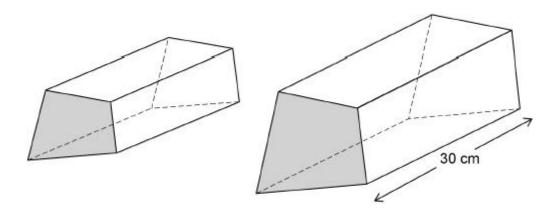
The cross sections are shaded.

#### Prism A

Prism A

volume =  $480 \text{ cm}^3$ 

length = 30 cm



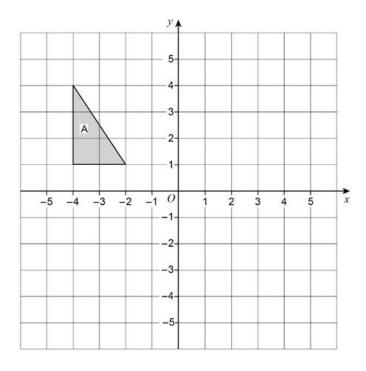
area of the cross section of A: area of the cross section of B = 4:9

Work out the area of the cross section of B.	
Answer	cm <sup>2</sup>
	 (Total 5 marks

## **Transformations**

## Q1.

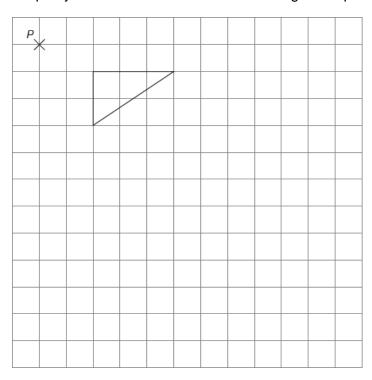
Reflect shape A in the x-axis.



(Total 2 marks)

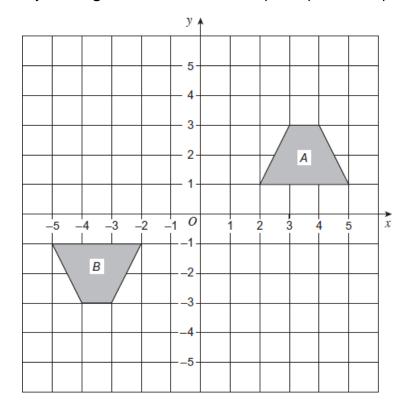
## Q2.

(a) Enlarge this shape by scale factor 2 with centre of enlargement point P.



(3)

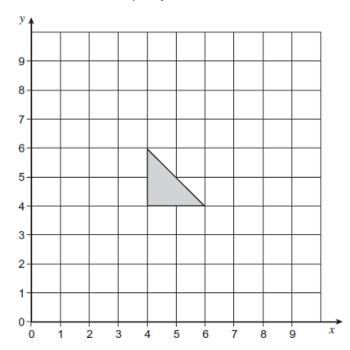
(b) Describe fully the **single** transformation that maps shape *A* to shape *B*.



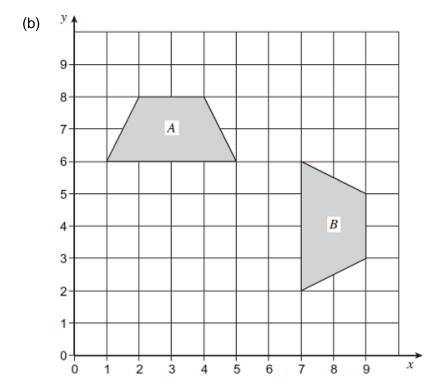
(3) (Total 6 marks)

Q3.

(a) Translate the shape by the vector



(2)



Describe fully the <b>single</b> transformation that takes shape $A$ to shape $B$ .	
	-
	- (3)
(Total 5)	marks)

Q4.

Which of these shapes has two lines of symmetry?

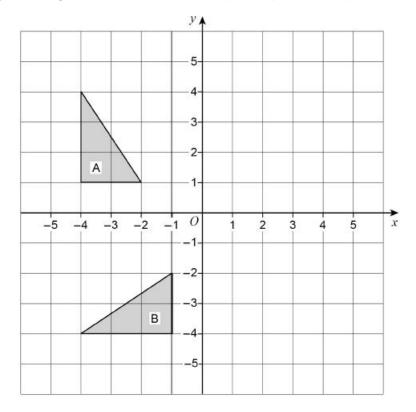
Circle your answer.

Semicircle Rhombus Trapezium Isosceles triangle

(Total 1 mark)

### Q5.

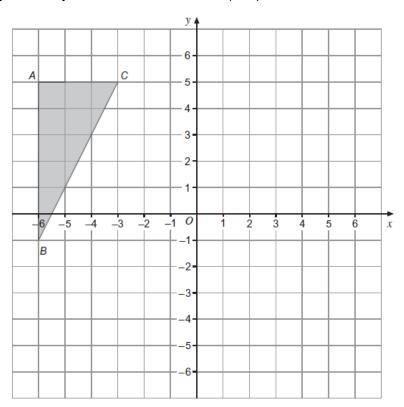
Describe fully the **single** transformation that maps shape A to shape B.



(Total 3 marks)

### Q6.

Enlarge triangle *ABC* by scale factor  $-\frac{2}{3}$  centre (0, 2).



(Total 2 marks)

### Q7.

3 translates A to B.

Circle the vector that translates B to A.

$$\begin{pmatrix} -2 \\ 3 \end{pmatrix}$$

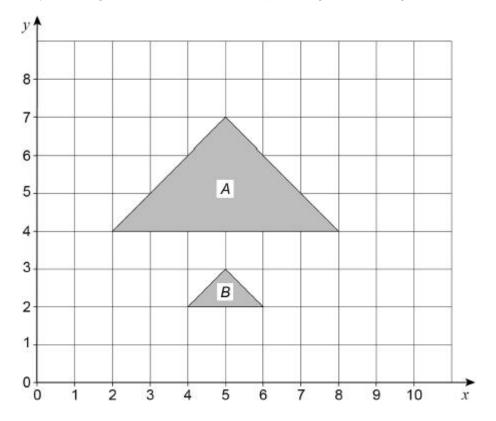
$$\begin{pmatrix} -2 \\ 3 \end{pmatrix} \qquad \qquad \begin{pmatrix} -3 \\ 2 \end{pmatrix} \qquad \qquad \begin{pmatrix} 3 \\ -2 \end{pmatrix} \qquad \qquad \begin{pmatrix} 2 \\ -3 \end{pmatrix}$$

$$\begin{pmatrix} 3 \\ -2 \end{pmatrix}$$

$$\begin{pmatrix} 2 \\ -3 \end{pmatrix}$$

# Q8.

Describe fully the single transformation that maps triangle A to triangle B.



\_\_\_\_

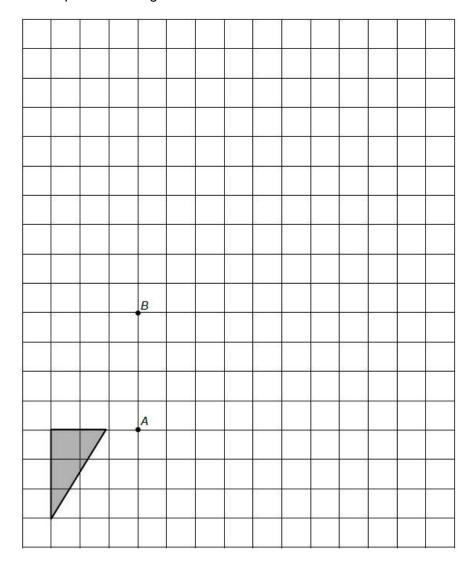
(Total 3 marks)

#### Q9.

The shape is **rotated** 90° clockwise about point *A*.

It is then **enlarged** by scale factor −2, centre B.

Draw the final shape on the diagram.



(Total 3 marks)

#### Q10.

A triangle has vertices at A(2, 1), B(3, 4) and C(6, 1)The triangle is reflected.

Points A and C do not move.

Circle the equation of the line of reflection.

$$y = x$$

$$X=2 y=1$$

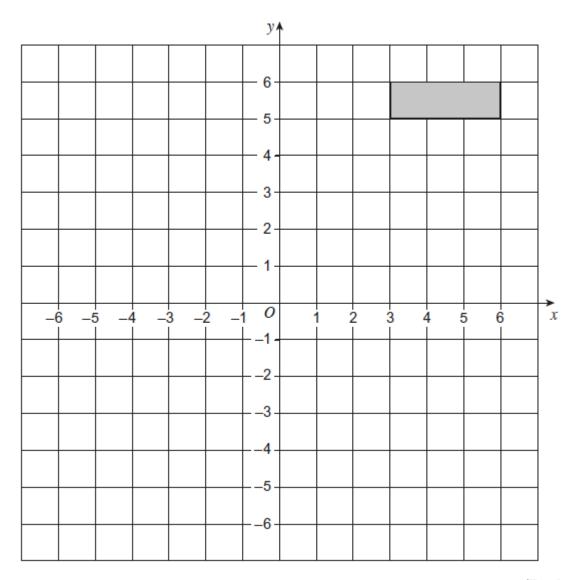
$$V = 1$$

$$X = 4$$

# Q11.

Enlarge the shape by scale factor –3

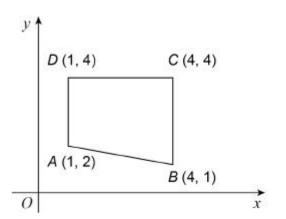
Use (3, 4) as the centre of enlargement.



(Total 3 marks)

#### Q12.

ABCD is a quadrilateral.



Not drawn accurately

The quadrilateral is reflected in the line X = 4

Which vertices are invariant?

Circle your answer.

A and D C and D

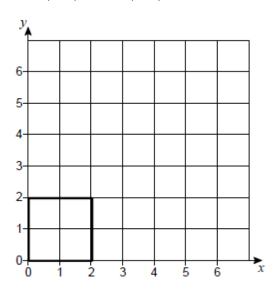
B and C

B and D

#### Q13.

Square OABC is drawn on a centimetre grid.

O is (0, 0) A is (2, 0) B is (2, 2) C is (0, 2)



(a) OABC is translated by the vector

Circle the number of invariant points on the perimeter of the square.

0 1 2 4

(b) OABC is enlarged, scale factor 2, centre (0, 0)

Circle the number of invariant points on the perimeter of the square.

0 1 2 4

(c) OABC is reflected in the line y = x

Circle the number of invariant points on the perimeter of the square.

0 1 2 4

(1) (Total 3 marks)

(1)

# **Direct and Inverse Proportion**

Q1.

(a)	Assuming that they all work at this rate,	
	how long will it take 3 people to paint the room?	
	Answer	hours
(b)	In fact, the <b>third</b> person works at a faster rate.	
` ,	How does this affect the time to paint the room?	
		(Total 3 m
). 15 ri	ulers cost £3	
	much do 40 rulers cost?	
	Thush do to falcie doct.	
	Answer £	
	Allower 2	(Total 2 m

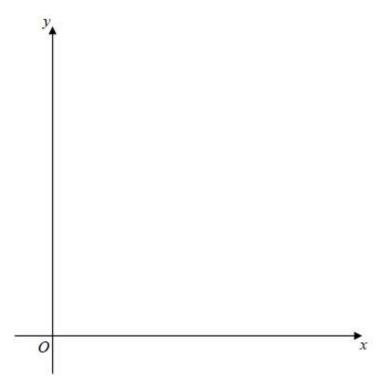
#### Q3.

y is inversely proportional to x for positive values. When x = 3.5, y = 4.2

(a) Work out the value of y when x = 5.6

Answer \_\_\_\_\_

(b) On the grid draw a sketch to show the relationship between y and x.



(1) (Total 4 marks)

(3)

0	1
w	4.

XY = C where C is a constant.

Circle the correct statement.

y is directly proportional to x

*y* is directly proportional to x

*y* is inversely proportional to  $\frac{1}{x}$ 

X is directly proportional to Y

(Total 1 mark)

#### Q5.

W is directly proportional to YW is inversely proportional to  $X^2$ 

(a) When y = 4, W = 14

Work out the value of W when y = 9

\_\_\_\_\_

Answer\_\_\_\_\_

(b) When X = 2, W = 5

Work out the value of W when X = 10

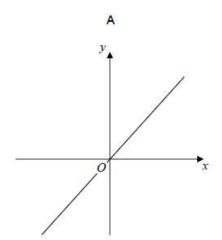
Answer

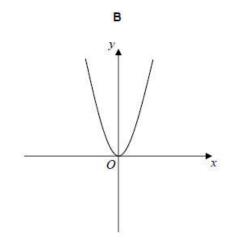
(3)

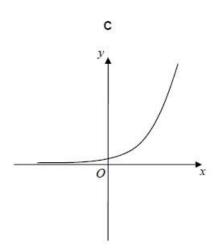
(2)

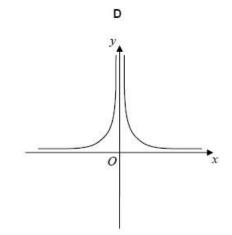
(c) Which graph shows the relationship between *y* and *x*?

Circle the correct letter.









(1) (Total 6 marks)

Q6.

$$y = \frac{10}{x}$$

If the value of X doubles, what happens to the value of Y?

Circle your answer.

Q7.		
A	A stone is thrown upwards with a speed of <i>V</i> metres per second.	
Т	The stone reaches a maximum height of $h$ metres.	
r	<i>h</i> is directly proportional to <i>V</i> ²	
V	When $V = 10$ , $h = 5$	
V	Nork out the maximum height reached when $V = 24$	
_		
_		
_		
_		
_		
_		
_		
	Answer m	
	(Total 4 r	narks)
Q8.		
Т	The mass of an ornament is $m{m}$ grams.	
Т	The height of the ornament is $m{h}$ centimetres.	
r	m is directly proportional to the cube of $h$ .	
r	m = 1600  when  h = 8	
(;	(a) Work out an equation connecting $m$ and $h$ .	

(3)

Answer \_\_\_\_\_

			Answer	=	grams
					(Total 5 mari
<b>Q9.</b>					
y is directly p Complete the	roportional to <i>X</i> table.				
y is directly p Complete the	table.	-8	0	7	
y is directly p Complete the	table.		0	7 63	
y is directly p Complete the	table.		0		(Total 2 mar
Complete the	table.		0		(Total 2 marl
Complete the	table.	-8	0		(Total 2 mark
Complete the	x y proportional to	-8	0		(Total 2 mark
Complete the  210.  y is inversely	x y proportional to	-8	6		(Total 2 mari

#### Q11.

The time of each swing of a pendulum, length I cm, is T seconds. T is directly proportional to the square root of I.

When I = 64 T = 1.6

Work out the value of T when I = 132.25

Answer \_\_\_\_\_ seconds
(Total 5 marks)

Q12.

$$y = \frac{10}{x^2}$$

What happens to the value of y as the value of x doubles? Circle your answer.

×2 ÷2 ×4 ÷4

_		_
(J	1	3

y is inversely proportional to  $\sqrt{x}$ 

y = 4 when x = 9

(a)	Work out an equation connecting $y$ and $x$ .	
	Answer	
		(3)
(b)	Work out the value of $y$ when $x = 25$	
	Answer	
	Allawei	(2)
	(Total	5 marks)

# **Shapes of Special Graphs**

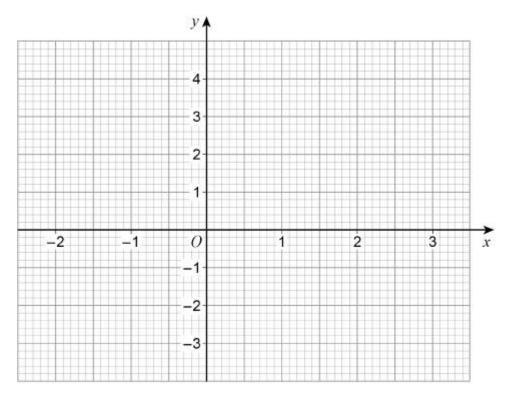
### Q1.

(a) Complete the table of values for  $y = x^2 - x - 2$ 

х	-2	-1	0	1	2	3
У			-2	-2		4

(2)

(b) Draw the graph of  $y = x^2 - x - 2$  for values of x from -2 to 3



(2)

(c) Write down the *x*-coordinate of the turning point of the graph.

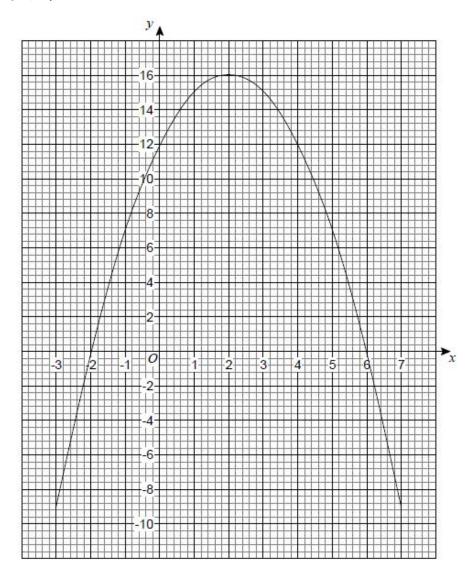
Answer
--------

(1)

(Total 5 marks)

### Q2.

The graph  $y = a + bx - x^2$  is shown.



(a) Circle the coordinates of the turning point of the curve.

(-2, 0)

(0, 12)

(2, 16)

(6, 0)

(1)

(b) Circle the value of *a*.

-2

12

16

6

(1)

(c) Circle the two roots of  $a + bx - x^2 = 0$ 

-2 and 6

2 and -6

2 and 6

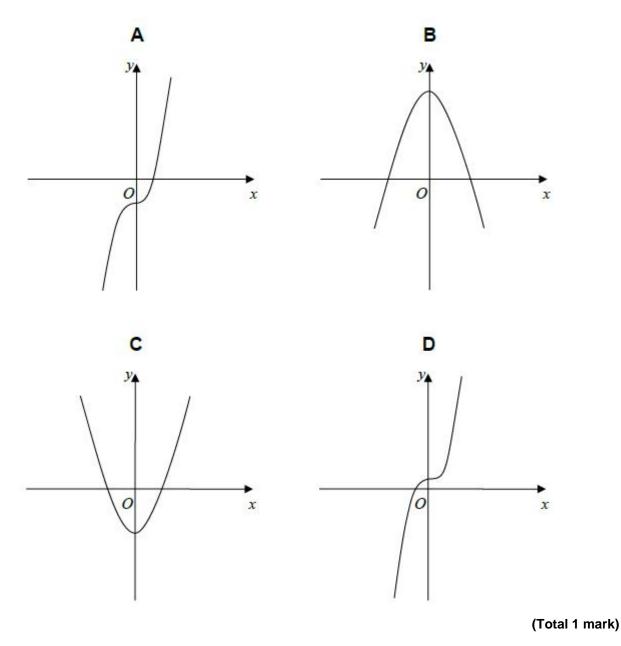
−2 and −6

(1) (Total 3 marks)

# Q3.

One of these is a sketch of  $y = x^3 + 2$ Which one?

Circle the correct letter.

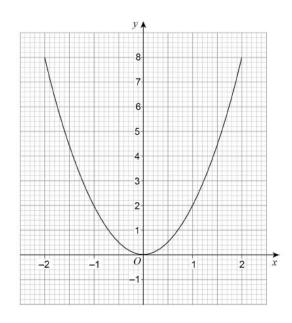


Q4.

(a) Meera is using a **graphical** method to solve  $2x^2 - 3x = 0$ 

She draws the graph of  $y = 2x^2$  and a straight line graph on the same grid.

Here is the graph of  $y = 2x^2$ 



Complete her method to solve  $2x^2 - 3x = 0$ 


\_\_\_\_\_

Answer			

(b) Levi is solving  $2x^2 + 5x = 0$ 

He uses this method.

$$2x^2 + 5x = 0$$
 subtract  $5x$  from both sides

 $2x^2 = -5x$  divide both sides by x

2x = -5 divide both sides by 2

$$x = -2.5$$

Evaluate his method and his answer.

(2)

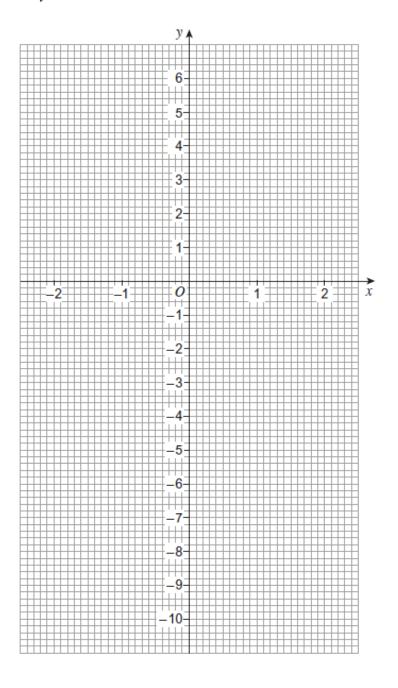
(2)

### Q5.

Here is a table of values for  $y = x^3 - 2$  for x = -2 to 2

х	-2	-2	0	1	2
у	-10	-3	-2	-1	6

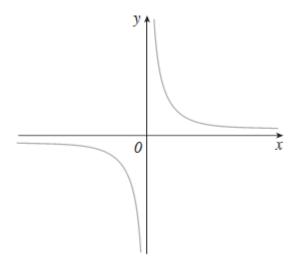
Draw the graph of  $y = x^3 - 2$  for values of x from -2 to 2



(Total 2 marks)

### Q6.

Circle a possible equation for the graph shown below. (a)



$$y = x^3$$

$$y = \frac{1}{x}$$

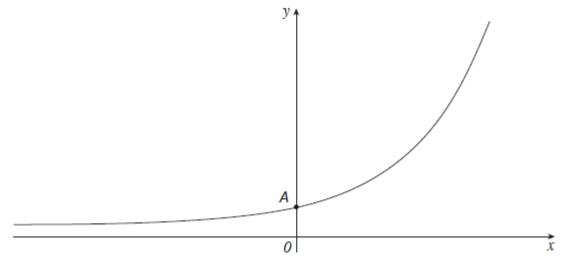
$$y = x^3$$
  $y = \frac{1}{x}$   $y = \cos x$   $y = \sin x$ 

$$y = \sin x$$

(1)

(b) This is the graph of  $y = 2^x$ 

Write down the co-ordinates of A.



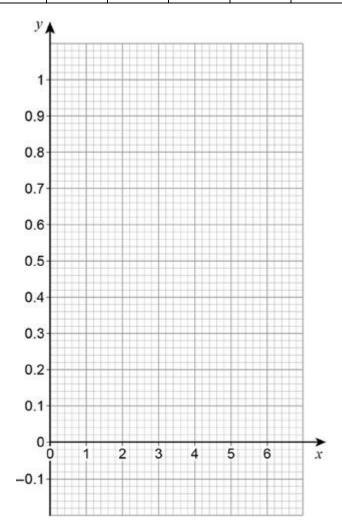
Answer ( \_\_\_\_\_

(Total 2 marks)

# Q7.

Draw the graph of  $y = 0.8^{x}$  for values of x from 0 to 6

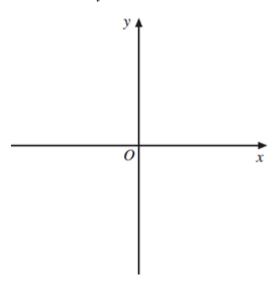
х	0	1	2	3	4	5	6
y							



(Total 3 marks)

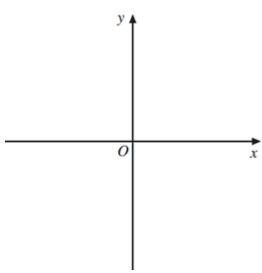
Q8.

(a) On the axes, make a sketch of  $y = x^3$ 



(1)

(b) On the axes, make a sketch of  $y = \frac{1}{x}$ 

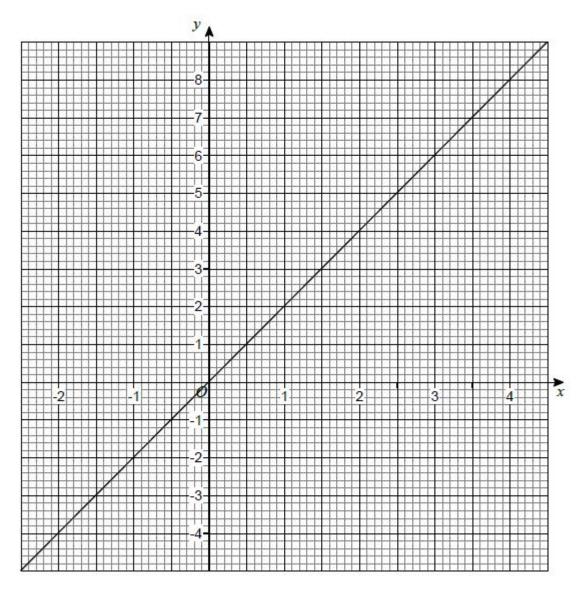


(1)

(Total 2 marks)

Q9.

The graph of y = 2x is shown.



By drawing the graph  $y = 3x^2 - 4$  on the grid, work out approximate solutions to  $3x^2 - 4 = 2x$ 

# Q10.

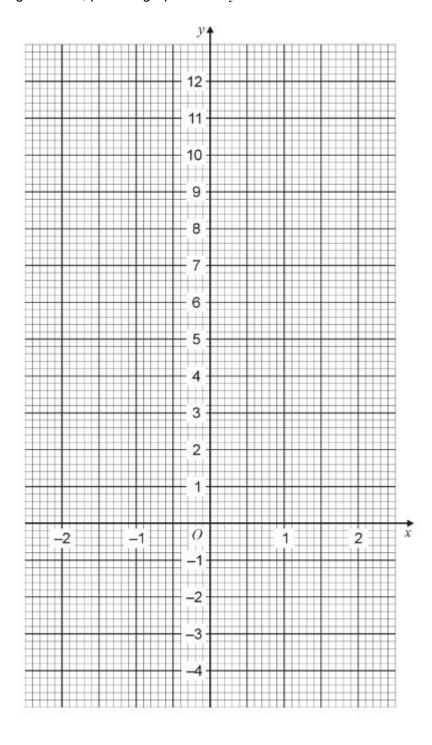
Complete the table of values for  $y = x^3 + 4$ 

х	-2	-1	0	1	2
у		3	4		12

(2)

(b) On the grid below, plot the graph of  $y = x^3 + 4$ 

for values of x from -2 to 2

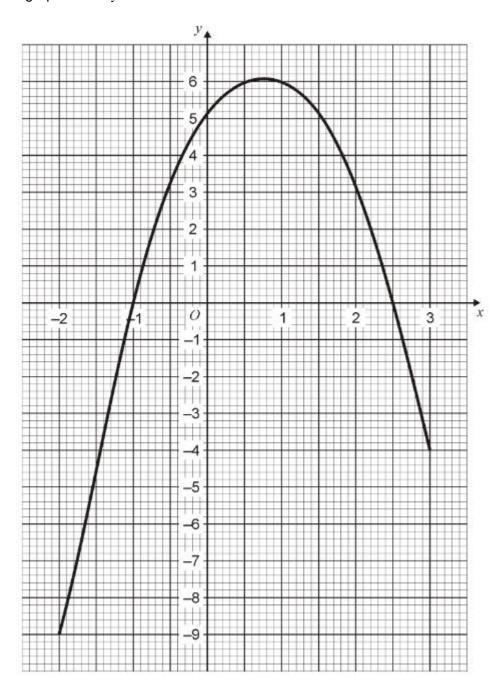


(2)

(c)

$$y = 5 + 3x - 2x^2$$

The graph of  $y = 5 + 3x - 2x^2$  is shown for values of x from -2 to 3



Write down the solutions of  $5 + 3x - 2x^2 = 0$ 

$$5 + 3x - 2x^2 = 0$$

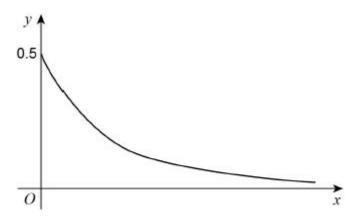
Answer \_\_\_\_\_ and \_\_\_\_

(2)

(Total 6 marks)

### Q11.

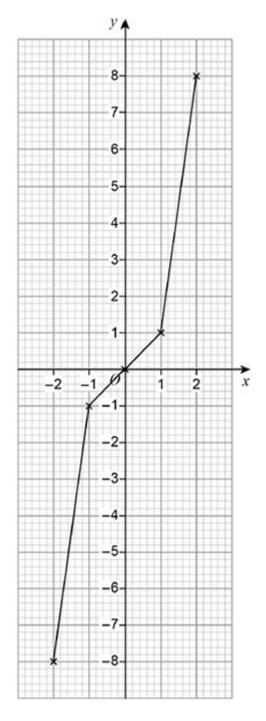
Nick sketches the graph of  $y = 0.5^x$  for  $x \ge 0$ 



Make **one** criticism of his sketch.

# Q12.

Lewis wants to draw the graph  $y = x^3$  for values of x from -2 to 2. Here is his graph.



Make one criticism of his graph.

\_\_\_\_\_

#### **Vectors**

Q1.

$$\mathbf{a} = \begin{pmatrix} -4 \\ -1 \end{pmatrix}$$
 and  $\mathbf{b} = \begin{pmatrix} 3 \\ -1 \end{pmatrix}$ 

Circle the vector 2a + b

- $\begin{pmatrix} -5 \\ -3 \end{pmatrix}$
- (-11) -3

- (-5) -1
- $\begin{pmatrix} -11 \\ -1 \end{pmatrix}$

(Total 1 mark)

Q2.

PQR is a straight line.

PQ: QR = 3:1

$$\overrightarrow{PQ} = \mathbf{a}$$

Not drawn accurately



Circle the vector RQ

$$\frac{1}{3}a$$

$$\frac{1}{4}a$$

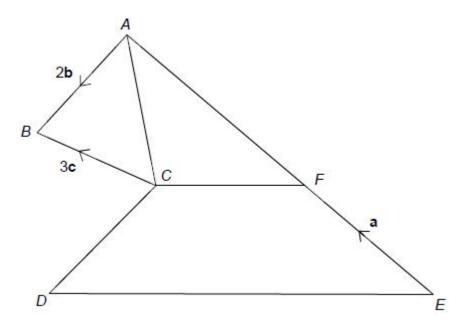
$$-\frac{1}{3}a$$

$$-\frac{1}{4}a$$

# Q3.

AFE is a straight line. AF: FE = 3: 2 DE is parallel to CF. DE = 2CF

 $\vec{EF} = \mathbf{a}$   $\vec{AB} = 2\mathbf{b}$   $\vec{CB} = 3\mathbf{c}$ 

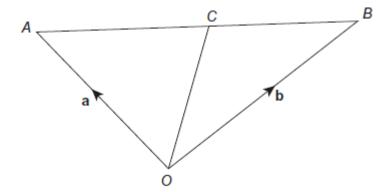


Work out DE in t	erms <b>a</b> , <b>b</b> and <b>c</b> .			
	Answ	ver		

(Total 4 marks)

### Q4.

C is the midpoint of the straight line AB.



 $\overrightarrow{OA} = a$ 

$$\overrightarrow{OB} = \mathbf{b}$$

(a) Work out  $\overrightarrow{OC}$  in terms of **a** and **b**. Simplify your answer.


(3)

(b) Hence, write down an expression for  $\overrightarrow{CO}$  in terms of **a** and **b**. Simplify your answer.

Answer	

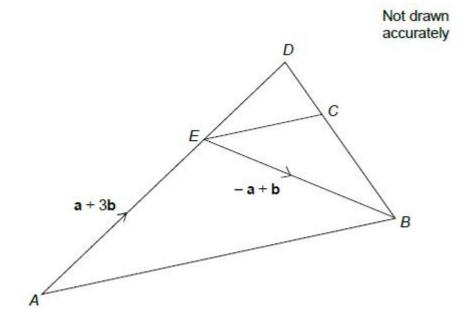
(1) (Total 4 marks)

### Q5.

AED is a straight line.

$$\overrightarrow{AE} = \mathbf{a} + 3\mathbf{b}$$

$$\overrightarrow{EB} = -\mathbf{a} + \mathbf{b}$$



		$\rightarrow$
(a)	Work out the vector	AB

Answer			
7 (113 (10)	 	 	

(1)

(b) Also 
$$\overrightarrow{ED} = \frac{1}{3} \overrightarrow{AE}$$
 and  $\overrightarrow{DC} = -\frac{1}{3} \mathbf{a}$ 

Prove that *EC* is parallel to *AB*.

(3)

### Q6.

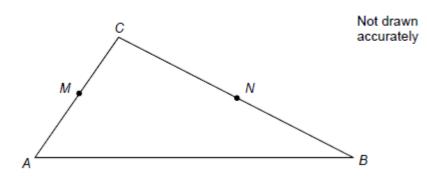
In triangle ABC

*M* is the midpoint of *AC* 

N is the point on BC where BN: NC = 2:3

$$\rightarrow$$
 $AC = 2a$ 

$$\overrightarrow{AB} = 3b$$



(a) Work out MN in terms of **a** and **b**.

			_	_	_	_	_
Give v	vour a	answer	in	its	sim	plest	form.


Answer \_\_\_\_\_

(b) Use your answer to part (a) to explain why MN is **not** parallel to AB.

(1) (Total 4 marks)

(3)

### Q7.

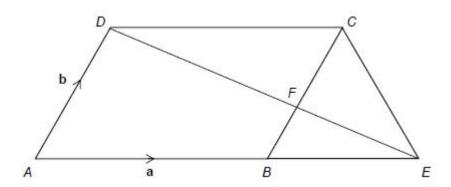
ABCD is a parallelogram.

ABE is a straight line and AB: BE = 3:2

BC and ED intersect at F.

$$\overrightarrow{AB} = \mathbf{a}$$
 and  $\overrightarrow{AD} = \mathbf{b}$ 

Not drawn accurately



Work out ED i	n terms of <b>a</b> and <b>b</b> .	
Give your ans	wer in its simplest form.	
	Answer	
_		
Deduce EF in	terms of <b>a</b> and <b>b</b> .	

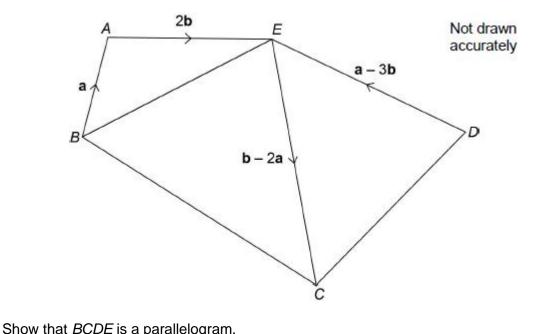
(2) (Total 5 marks)

Q8.	
5a-2b $3a-9$ $3a+b$	Not drawn accurately
B C	D
Is BCD a straight line?	
Show working to support your answe	r.
Answe	er

(Total 3 marks)

### Q9.

ABCDE is a pentagon.




(Total 3 marks)