

AQA Practice GCSE Examination Paper Higher Set 2 Paper 1 Non-Calculator	Time: 1 hour 30 minutes	Set 2 of 10
	Standard equipment: pen, pencil, ruler, protractor, compasses. Do not use a calculator.	
Instructions to candidates: Do not write on this paper. You must show all of your working. Write all answers on separate paper, except where instructed to answer in your work booklet . <i>In an examination you will normally be required to write your answers in the spaces provided in the question paper.</i>		

1. (a) Select the smallest number.

6.4 6.4 6.54 6.45 (1)

- (b) Select the largest number.

1.7 1.7 1.07 1.77 (1)

Total 2 Marks

2. w is inversely proportional to z .

When $z = 12$, $w = 4.5$.

Select the correct expression for w in terms of z .

$w = 0.375z$ $w = \frac{16.5}{z}$ $w = 54z$ $w = \frac{54}{z}$

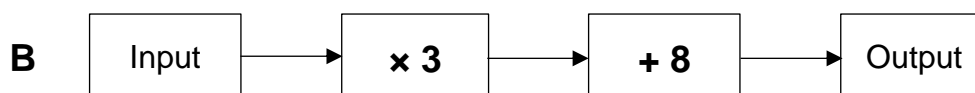
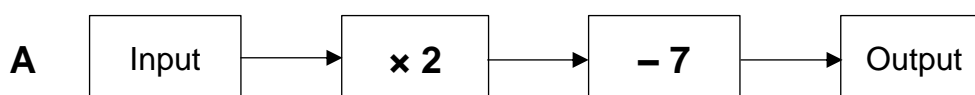
Total 1 Mark

3. Select the exact value of $\tan 60^\circ$.

1 $\sqrt{3}$ $\frac{1}{2}$ $\frac{\sqrt{3}}{2}$

Total 1 Mark

4. Here are two number machines, A and B.

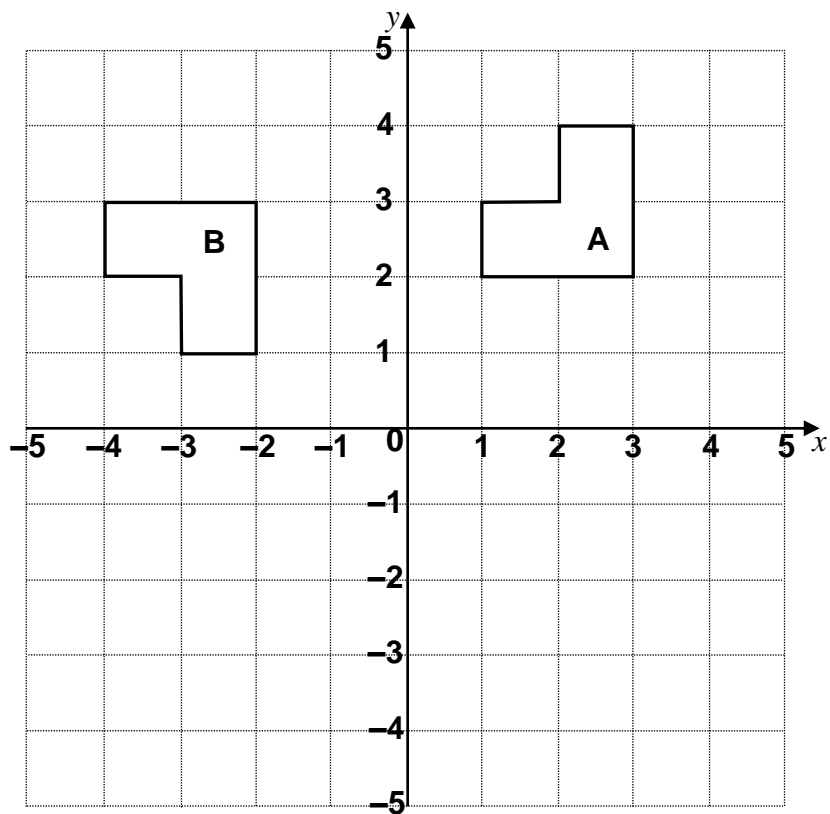


You are given that both number machines have the same output.

Work out the **output** when the input of A is four times the input of B.

Total 4 Marks

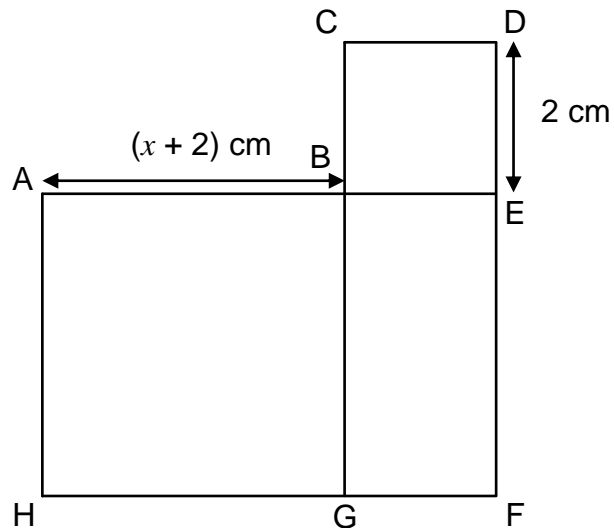
5.



Describe the single transformation that maps shape A onto shape B.

Total 2 Marks

6.



ABGH is a square.

BEFG is a rectangle.

BCDE is a square.

The three shapes are joined together to make a larger shape.

(a) Show that the total area of the larger shape is $x^2 + 6x + 12$.

(4)

Given that the area of the larger shape is 39 cm^2 ,

(b) Work out the value of x .

You must show all of your working.

(2)

Total 6 Marks

7. Rafael is given the following equation:

$$(x + 2)(x + 5) = 3(x + 2)$$

He attempts to solve the equation.
Here are his incorrect workings.

		x	2
Step 1	x	$2x$	$x+2$
	5	$x+5$	7
Step 2	$2x + (x+2) + (x+5) + 7 = 3(x+2)$		
Step 3	$4x + 14 = 3(x+2)$		
Step 4	$4x + 14 = 3x + 6$		
Step 5	$x + 14 = 6$		
Step 6	$x = -8$		

- (a) In which step did Rafael make his first mistake?
Select your answer.

Step 1

Step 2

Step 3

Step 4

(1)

- (b) Solve the equation $(x + 2)(x + 5) = 3(x + 2)$.

(4)

Total 5 Marks

8. James draws an irregular polygon.
The smallest angle in James' polygon is 35° .
James then enlarges his polygon by scale factor 5.
James says,

"The smallest angle in my enlarged shape is 175° because $5 \times 35 = 175$."

Is James correct?
Choose your answer.
Explain why.

Yes

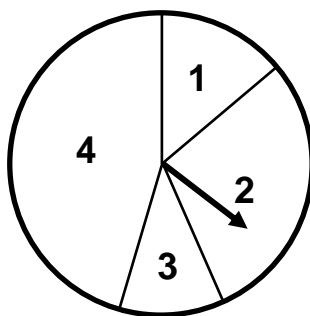
☐

No

☐

Total 1 Mark

9. A fair spinner has four sections.



Not Drawn
Accurately

Chris says,

“There are four sections on the spinner so the probability of the spinner landing on 3 is $\frac{1}{4}$.”

Chris also says,

“The probability of the spinner landing on 3 twice in a row is $\frac{1}{2}$ because

$$\frac{1}{4} + \frac{1}{4} = \frac{1}{2}.”$$

- (a) Write down two mistakes Chris made when calculating these probabilities. (2)

The probability of spinning 1 twice in a row is $\frac{1}{36}$.

- (b) Work out the angle of the sector labelled 1. (3)

Total 5 Marks

10. Write $6(8x+3) - 4(5x-2) - 4$ in the form $a(bx+c)$

where a , b and c are positive integers.

You must show all of your working.

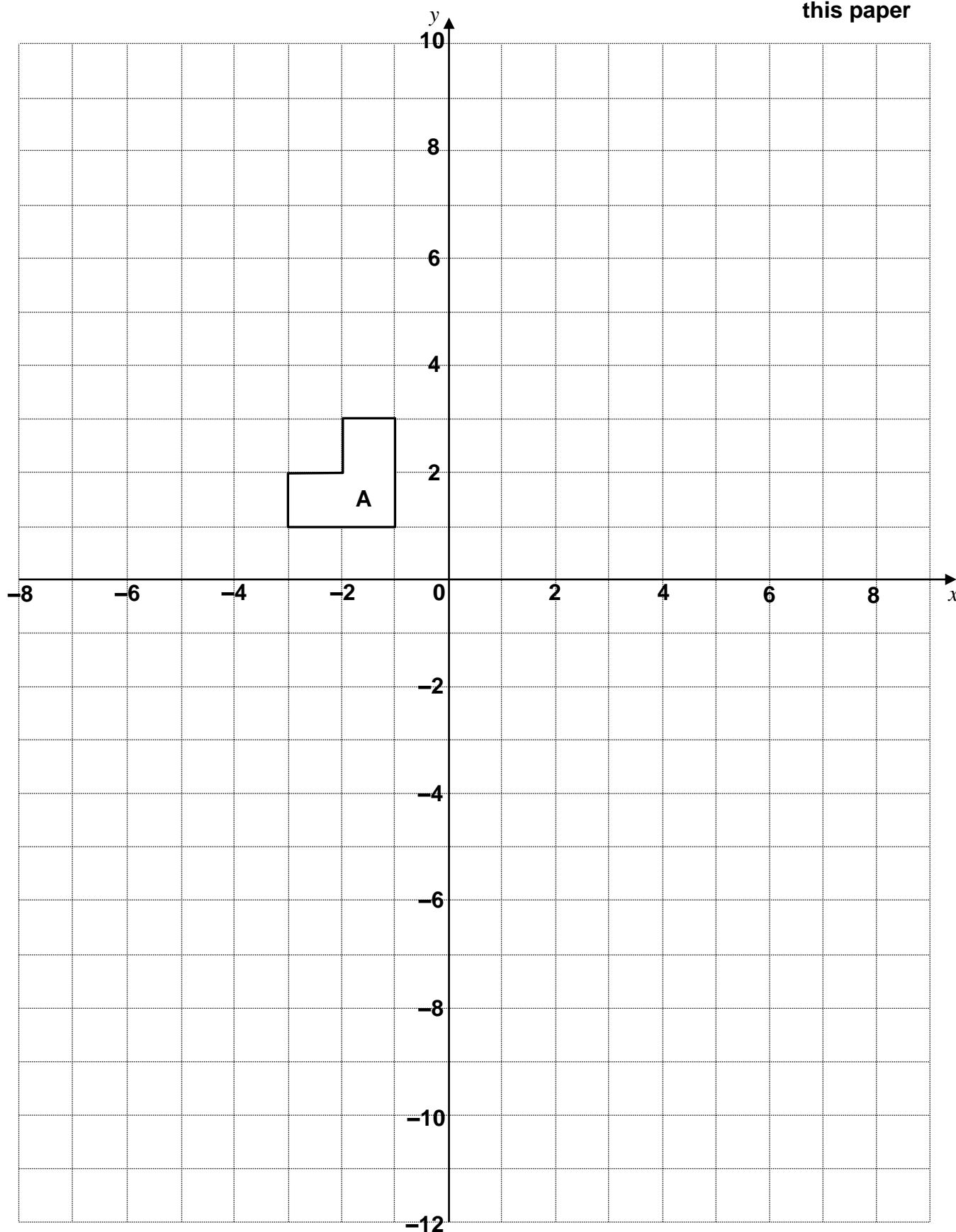
Total 3 Marks

11. Work out an estimate for $\sqrt[3]{4.21 \times (18.92 - 2.75)}$

Total 3 Marks

12.

Do not
write on
this paper



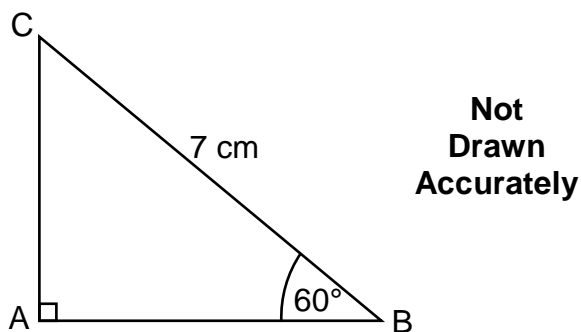
- (a) On the copy of the grid in your **work booklet**, enlarge shape A by scale factor -3 , centre $(0, 0)$.
Label this shape B. (2)
- (b) Describe the single transformation that maps shape B onto shape A. (1)

Total 3 Marks

13. $(2x-5)^2 + px + q = 4x^2 + 2x + 17$
 p and q are both integer constants.
 Find p and q .

Total 4 Marks

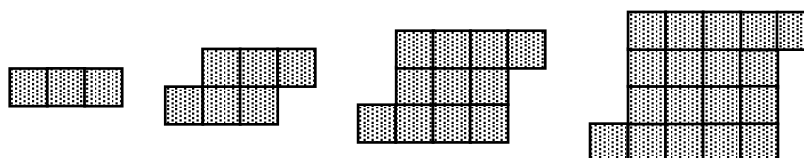
14.



Given that $\cos 60^\circ = 0.5$, work out the length of AB.

Total 3 Marks

15. The first four patterns in a sequence are shown below:

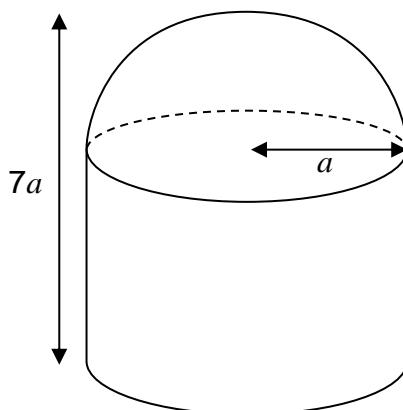


Give an expression for the number of squares in the n^{th} pattern.

Total 2 Marks

16. An object consists of a hemisphere on top of a cylinder.

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



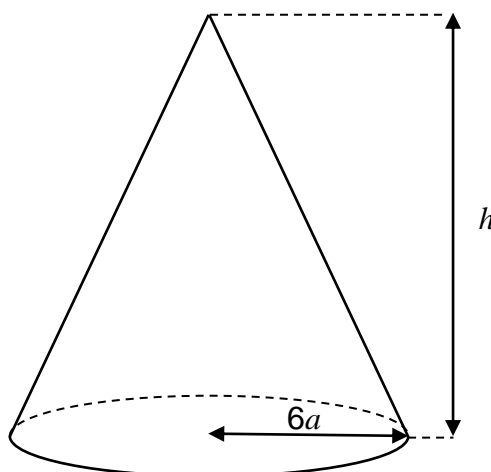
**Not
Drawn
Accurately**

$$\text{Total height of object} = 7a$$

$$\text{Radius of cylinder} = \text{radius of hemisphere} = a$$

The cone shown below has the same volume as the object.

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



**Not
Drawn
Accurately**

$$\text{Total height of cone} = h$$

$$\text{Radius of cone} = 6a$$

Find an expression for h in terms of a .

Give your answer in its simplest possible form.

Total 5 Marks

17. John has a ball of string.

The total length of the string in the ball is $4\frac{7}{8}$ m.

John cuts a length of string from the ball which is $2\frac{1}{4}$ m.

What fraction of the ball of string did John cut off?

Give your answer in its simplest form.

Total 3 Marks

18. Corine has a problem to solve:

A sphere has surface area 144π cm.
Find the volume of the sphere in terms of π .

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

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

Corine carries out the following steps in the order shown:

- Square-root answer
- Divide by 4π
- Multiply by $\frac{4}{3}\pi$
- Cube answer

Evaluate the method that Corine has used.

Total 2 Marks

19. Show that $10\sin 60^\circ + 6\tan 30^\circ$ can be written in the form $a\sqrt{b}$,
where a and b are integers.

Total 3 Marks

20. Evaluate $16^{-\frac{3}{2}}$

Total 3 Marks

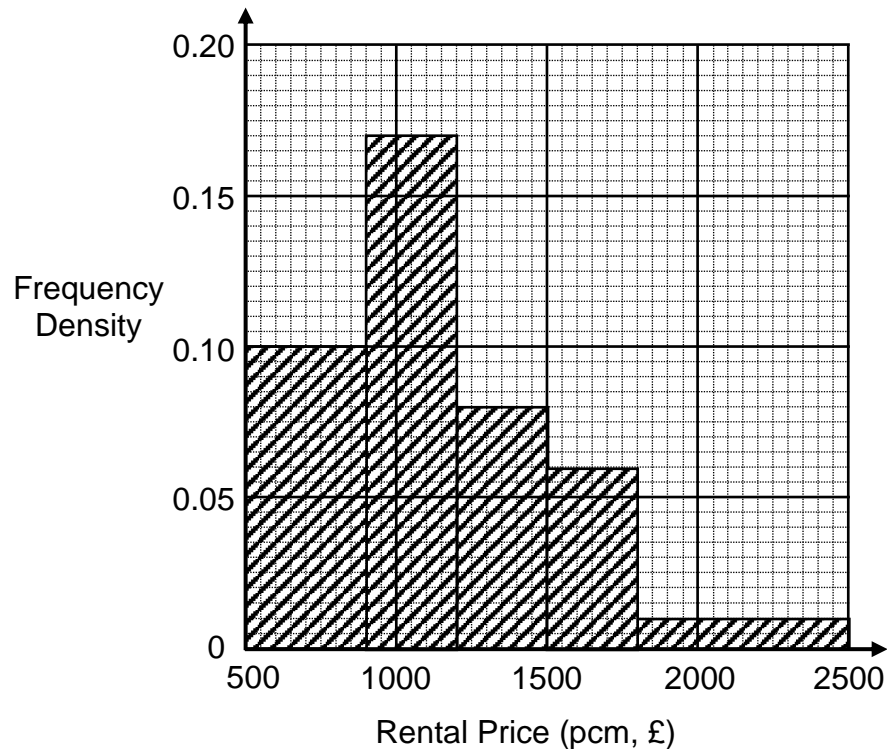
21. A toy train is placed on the floor.
It moves in a straight line from rest.
It travels with constant acceleration for 4 seconds, reaching a velocity of 3 m/s.
It travels at a constant velocity of 3 m/s for 5 seconds.
It then slows down with a constant deceleration of 0.5 m/s^2 for 2 seconds.
It then hits a wall and comes to a stop.

(a) Draw a velocity-time graph for the toy train.
*A grid has been provided in your **work booklet**.* (3)

(b) Work out the total distance travelled by the toy train. (3)

Total 6 Marks

22. Information about the rental price per calendar month (pcm) of 1 bedroom flats in Town A was recorded in a histogram.



- (a) Use the histogram to complete the grouped frequency table in your **work booklet**. (2)

Price per calendar month, p (£)	Frequency
$500 < p \leq 900$	
$900 < p \leq 1200$	
$1200 < p \leq 1500$	
$1500 < p \leq 1800$	
$1800 < p \leq 2500$	

**Do not
write on
this paper**

25% of the flats did not have an oven.

The flats which did not have an oven were the flats with the lowest rent prices.

- (b) Work out an estimate for the maximum rent a person renting a 1 bedroom flat without an oven may be paying. (3)

Total 5 Marks

23. The ratio of the number of men to the number of women in an office is 2 : 3.
Four women leave the office.
The ratio of the number of men to the number of women in the office is now 4 : 5.

Work out the number of men in the office.

Total 4 Marks

24. (a) What is 582,000 written in standard form?
Select your answer.

5.82×10^3 5.82×10^4 5.82×10^5 5.82×10^6 (1)

- (b) What is 7.2×10^{-3} written as an ordinary number?
Select your answer.

0.072 0.0072 0.00072 0.000072 (1)

- (c) Work out $(4 \times 10^3) \times (7 \times 10^5)$
Give your answer in standard form.

(2)

Total 4 Marks

Total For Paper: 80 Marks