

Please write clearly in block capitals.

Centre number

--	--	--	--	--

Candidate number

--	--	--	--

Surname

Forename(s)

Candidate signature

GCSE MATHEMATICS

H

Higher Tier

Paper 1 Non-Calculator

Thursday 25 May 2017

Morning

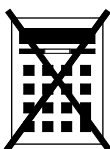
Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- mathematical instruments.

You must **not** use a calculator.



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

Advice

- In all calculations, show clearly how you work out your answer.

For Examiner's Use

Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
TOTAL	



J U N 1 7 8 3 0 0 1 H 0 1

Answer **all** questions in the spaces provided

- 1** Simplify $2^5 \times 2^3$
Circle your answer.

[1 mark]

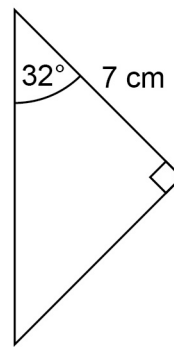
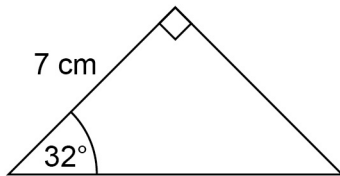
4^8

2^8

2^{15}

4^{15}

2



Not drawn
accurately

Circle the reason why these triangles are congruent.

[1 mark]

SSS

SAS

ASA

RHS

- 3** Which of these is a geometric progression?
Circle your answer.

[1 mark]

2, 4, 6, 8, 10

2, 3, 5, 8, 12

2, 6, 18, 54, 162

2, 6, 10, 14, 18



4 $a : b = 4 : 3$

Circle the correct statement.

[1 mark]

b is $\frac{4}{7}$ of a

b is $\frac{3}{7}$ of a

b is $\frac{4}{3}$ of a

b is $\frac{3}{4}$ of a

5 Write 36 as a product of prime factors.

Give your answer in index form.

[3 marks]

Answer _____

Turn over for the next question

Turn over ►



- 6 The table shows information about the times for 10 people to complete a task.

Time, t (minutes)	Frequency
$0 < t \leq 20$	1
$20 < t \leq 40$	6
$40 < t \leq 60$	3

These statements are about the mean and range of the actual times.

Tick the correct box for each statement.

[4 marks]

	True	False
The mean could be less than 20 minutes	☐	☐
The mean could be more than 40 minutes	☐	☐
The mean could be less than 40 minutes	☐	☐
The range could be more than 40 minutes	☐	☐
The range could be less than 40 minutes	☐	☐
The range could be more than 60 minutes	☐	☐



7 $\frac{3}{5}$ of a number is 162

Work out the number.

[2 marks]

Answer _____

8 x km/h = y mph

Use 8 km/h = 5 mph to write a formula for y in terms of x .

[2 marks]

Answer _____

Turn over for the next question



9 (a) $\text{Density} = \frac{\text{mass}}{\text{volume}}$

The mass of solid A is 6 times the mass of solid B.

The volume of solid A is 3 times the volume of solid B.

Complete the sentence.

[1 mark]

The density of solid A is _____ times the density of solid B.

9 (b) $\text{Average speed} = \frac{\text{distance}}{\text{time}}$

If the distance is halved and the time is doubled, what happens to the average speed?

Circle your answer.

[1 mark]

$\times 2$

$\times 4$

no change

$\div 2$

$\div 4$



10 Solve the simultaneous equations.

$$2x + y = 18$$

$$x - y = 6$$

[3 marks]

Answer _____

Turn over for the next question



11 Billy wants to buy these tickets for a show.

4 adult tickets at £15 each

2 child tickets at £10 each

A 10% booking fee is added to the ticket price.

3% is then added for paying by credit card.

Work out the **total** charge for these tickets when paying by credit card.

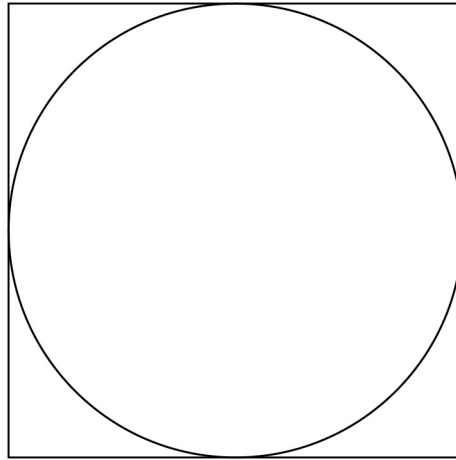
[5 marks]

Answer £ _____



12

Here is a circle touching a square.

Not drawn
accuratelyThe area of the square is 64 cm^2

Work out the area of the circle.

Give your answer in terms of π .**[3 marks]**

Answer _____ cm^2 **Turn over for the next question****Turn over ►**

- 13 Write the number six million five thousand two hundred in standard form.

[2 marks]

Answer _____

- 14 Solve $-3x > 6$

[1 mark]

Answer _____

- 15 $\frac{1}{6}$, $\frac{1}{7}$, $\frac{1}{8}$ and $\frac{1}{9}$ are four fractions.

How many of these fractions convert to a recurring decimal?

Circle your answer.

[1 mark]

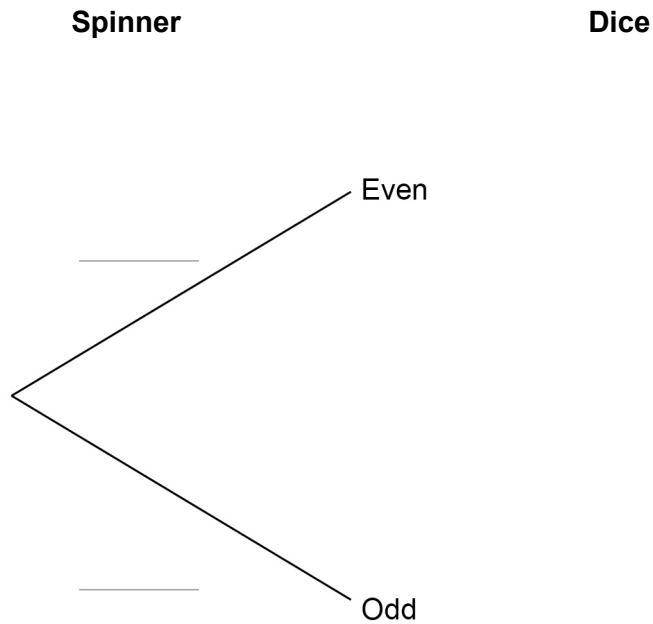
0 1 2 3 4



- 16** A fair spinner has five equal sections numbered 1, 2, 3, 4 and 5
A fair six-sided dice has five red faces and one green face.
The spinner is spun.
If the spinner shows an even number, the dice is thrown.

- 16 (a)** Complete the tree diagram for the spinner and the dice.

[2 marks]



- 16 (b)** Work out the probability of getting an even number and the colour green.

[2 marks]

Answer _____



- 17** A is the point $(2, -5)$
 B is the point $(4, -9)$

- 17 (a)** Show that the gradient of the straight line passing through A and B is -2

[2 marks]

- 17 (b)** C is the point $(-301, 601)$

Does C lie on the straight line passing through A and B ?

You **must** show your working.

[2 marks]

Answer _____



The normal price of a bottle is the same at each shop.

Get 2 more bottles at half price

Get 3 more bottles at half price

30% off a bottle

You **must** show your working.

[3 marks]

Answer

7

Turn over ►

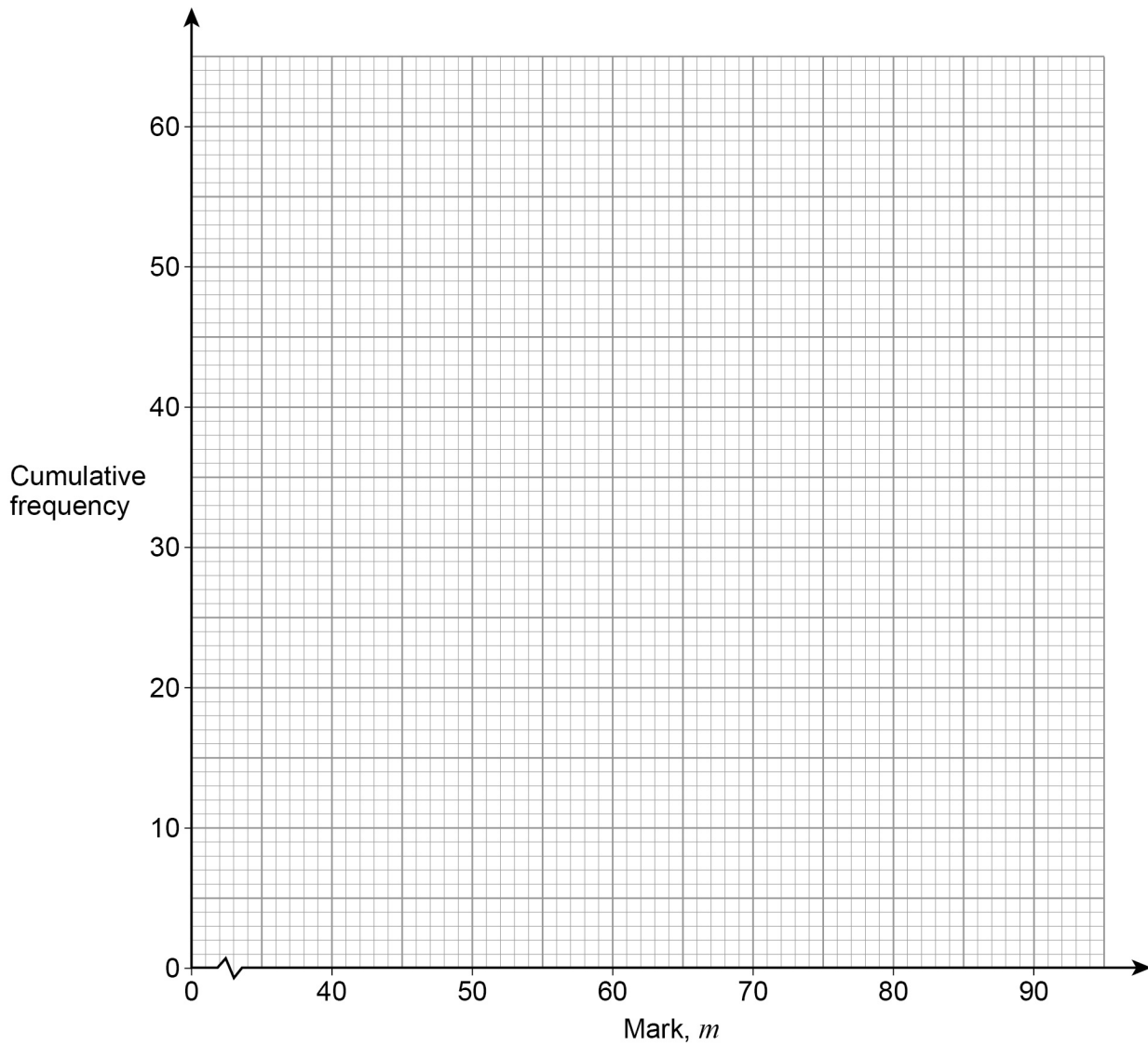


- 19** Here is some information about the marks of 60 students in a test.

Mark, m	Frequency		
$40 < m \leq 50$	9		
$50 < m \leq 60$	16		
$60 < m \leq 70$	20		
$70 < m \leq 80$	8		
$80 < m \leq 90$	7		

- 19 (a)** On the grid, draw a cumulative frequency graph.

[3 marks]



19 (b) Use your graph to estimate the lowest mark of the top 20% of students.

[2 marks]

Answer _____

20 Work out the diameter of the circle $x^2 + y^2 = 64$
Circle your answer.

[1 mark]

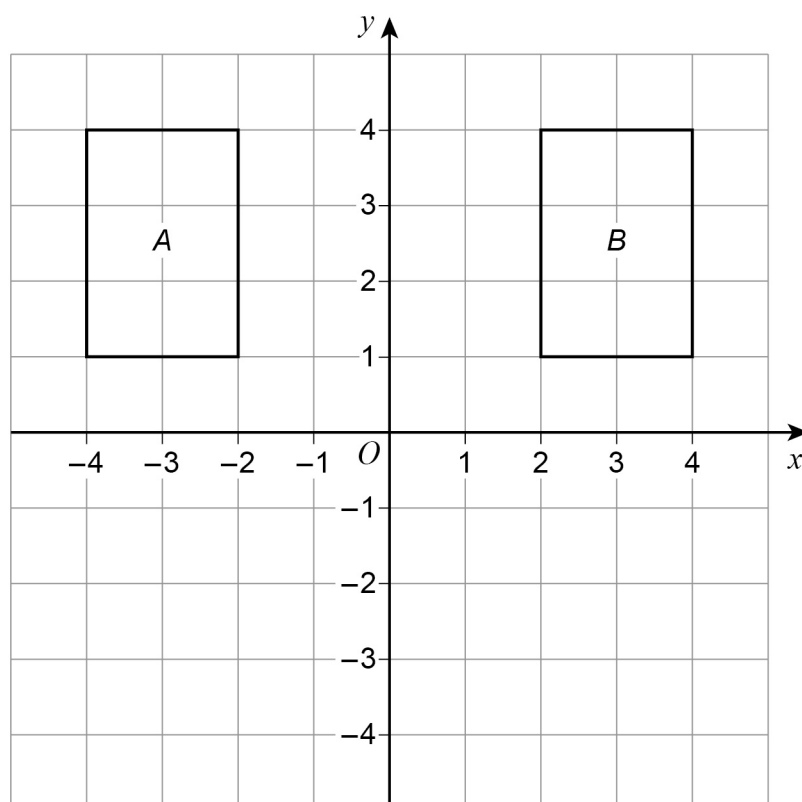
8 16 32 128

Turn over for the next question

Turn over ►



21 (a) The diagram shows rectangles A and B.



Rectangle A can be mapped to rectangle B by a **single** transformation.

Javed says,

“The **only** single transformation is a reflection in the y -axis because the rectangles are on opposite sides of the y -axis.”

Is he correct?

Tick a box.

Yes

☐

No

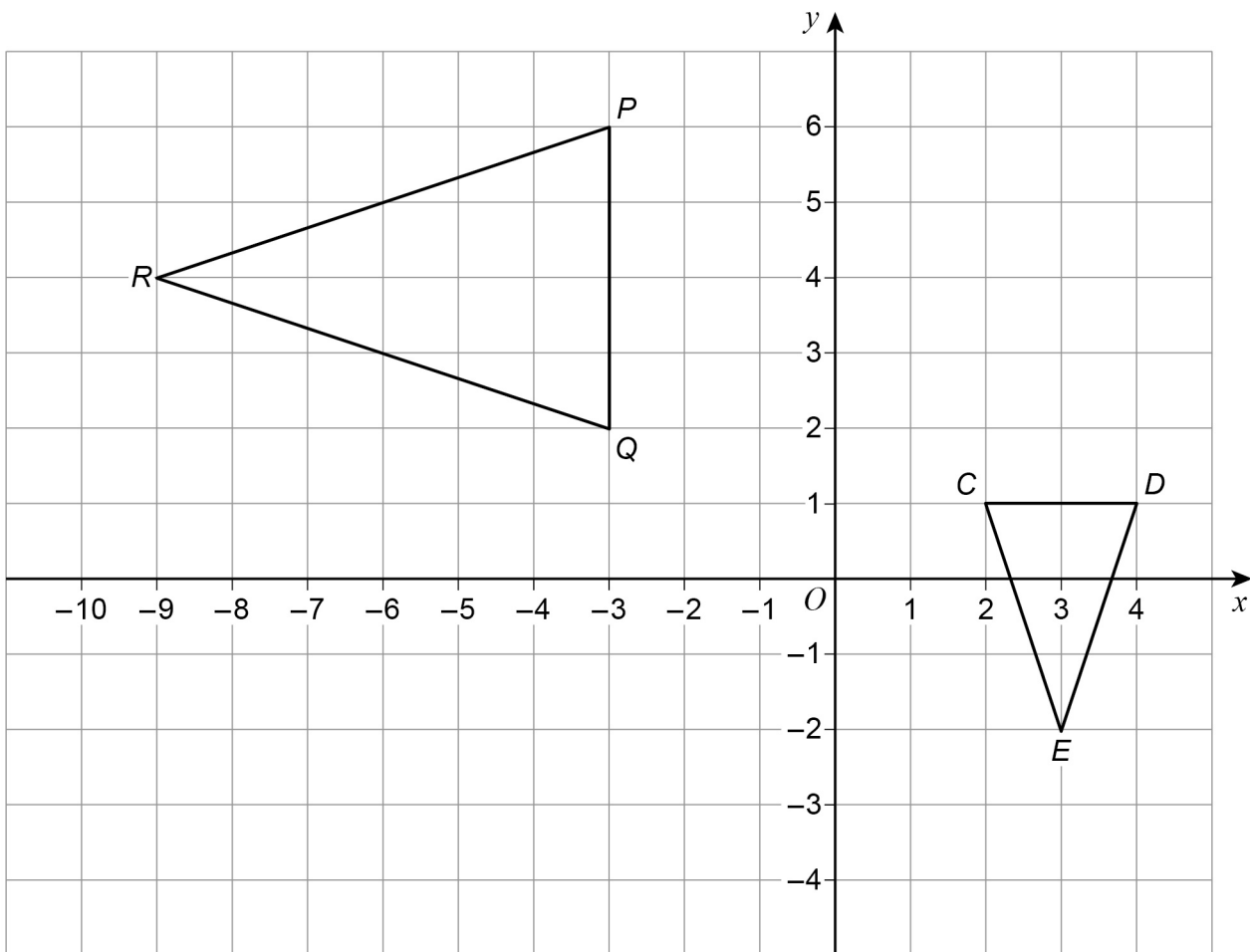
☐

Give a reason for your answer.

[1 mark]



21 (b) This diagram shows triangles CDE and PQR .



CDE is mapped to PQR by combining two single transformations.

The first is a rotation of 90° anticlockwise about E .

Describe fully the second transformation.

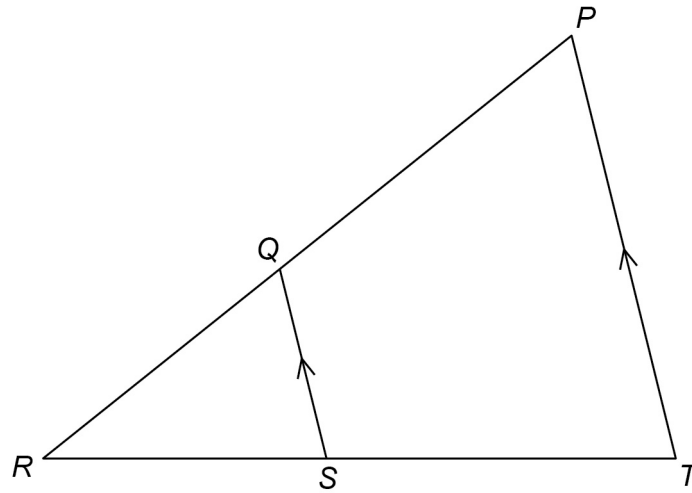
[3 marks]

Turn over for the next question

Turn over ►



22

 PRT and QRS are similar triangles.Not drawn
accuratelyWhich of these is equivalent to $\frac{QR}{PR}$?

Circle your answer.

[1 mark]

$$\frac{RS}{ST}$$

$$\frac{QS}{PT}$$

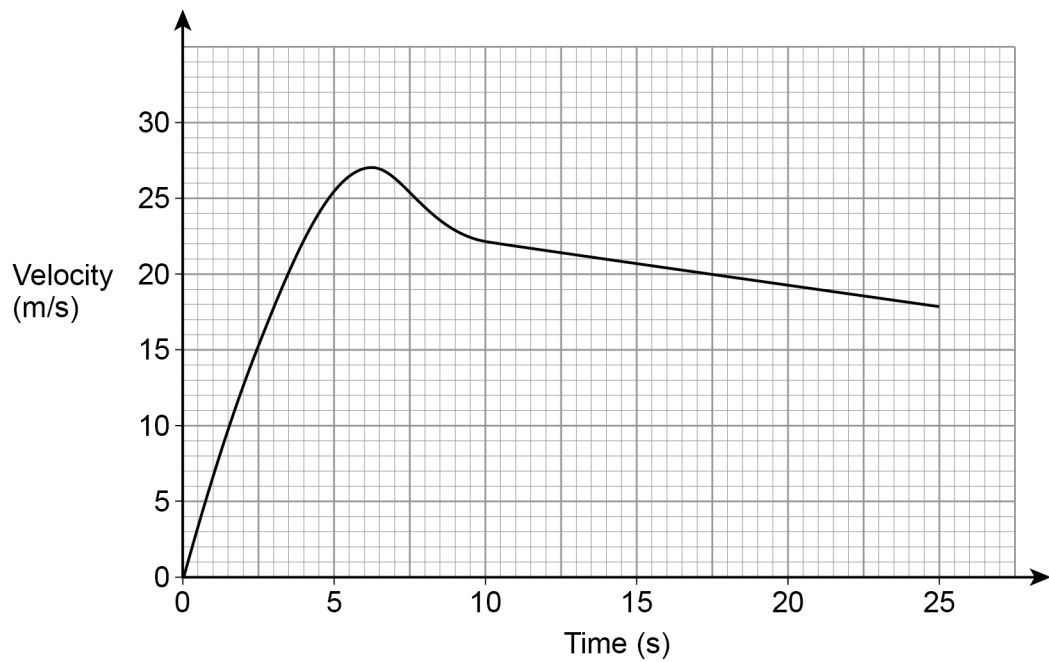
$$\frac{PT}{QS}$$

$$\frac{RT}{RS}$$



23

Here is a velocity-time graph of a motorbike for 25 seconds.



23 (a) After how many seconds was the acceleration zero?

[1 mark]

Answer _____ seconds

23 (b) Work out the distance travelled in the last 15 seconds.

[2 marks]

Answer _____ metres



24 (a) Work out $\sqrt{12\frac{1}{4}}$ as an improper fraction.

[1 mark]

Answer _____

24 (b) Work out $\sqrt[3]{16}$ as a power of 2

[2 marks]

Answer _____



In an office there are twice as many females as males.

$\frac{3}{8}$ of the males wear glasses.

84 people in the office wear glasses.

Work out the number of people in the office.

[4 marks]

Answer

Turn over for the next question

7

Turn over ►



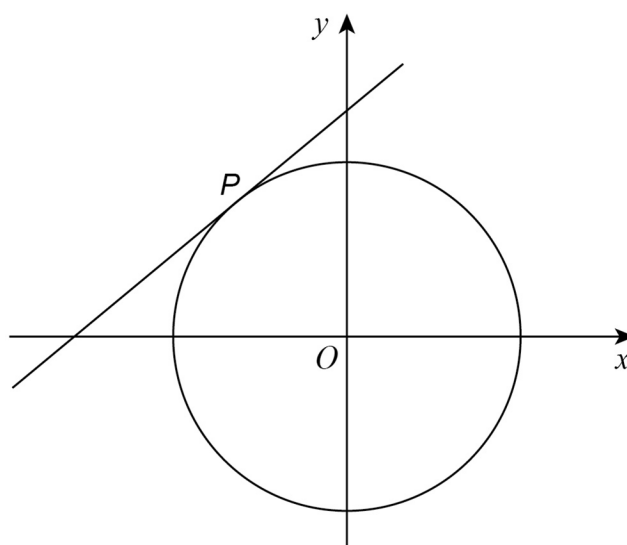
26

Expand and simplify $(x - 4)(2x + 3y)^2$ **[4 marks]**

Answer _____



27

 $P(-1, 4)$ is a point on a circle, centre O Not drawn
accuratelyWork out the equation of the tangent to the circle at P .Give your answer in the form $y = mx + c$ **[4 marks]**

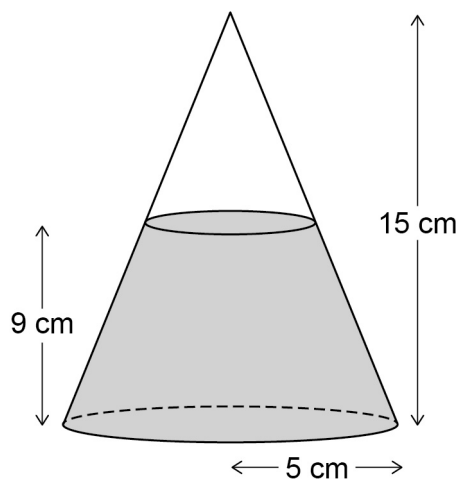
Answer _____



Volume of cone = $\frac{1}{3}\pi r^2 h$ where r is the radius and h is the perpendicular height.

height of 15 cm

The cone contains water to a depth of 9 cm



Work out the volume of the water, in cm^3

Give your answer in terms of π .

[4 marks]

[illegible]

Answer cm³



29 Simplify $\frac{2 \sin 45^\circ - \tan 45^\circ}{4 \tan 60^\circ}$

Give your answer in the form $\frac{\sqrt{a} - \sqrt{b}}{c}$ where a , b and c are integers.

[4 marks]

Answer _____

END OF QUESTIONS



There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**



There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**



There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**

Copyright Information

For confidentiality purposes, from the November 2015 examination series, acknowledgements of third party copyright material will be published in a separate booklet rather than including them on the examination paper or support materials. This booklet is published after each examination series and is available for free download from www.aqa.org.uk after the live examination series.

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright-holders may have been unsuccessful and AQA will be happy to rectify any omissions of acknowledgements. If you have any queries please contact the Copyright Team, AQA, Stag Hill House, Guildford, GU2 7XJ.

Copyright © 2017 AQA and its licensors. All rights reserved.

