



THIRD SPACE
LEARNING

Mathematics

Paper 3

(Calculator)

Higher Tier

AQA GCSE

SET 3

Mathematics Paper 3 (Calculator) Higher Tier AQA GCSE

SET 3

Name

Total marks



Paper length: 1hr 30mins

Instructions

- Use black ink or ball-point pen.
- Fill in the boxes at the top of this page with your name, centre number and candidate number.
- Answer all questions.
- Answer the questions in the spaces provided – there may be more space than you need.
- You must show all your working.
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- Calculators may be used.

Information

- The total mark for this paper is 80
- The marks for each question are shown in brackets – use this as a guide as to how much time to spend on each question.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Question	Mark
1	
2	
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24	
25	

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

This practice paper is based on the topics from the **advanced information for the November 2024 exam series.**

Please note, this practice paper is an example to help revision, these topics can be tested in other ways and other topics may be included in the actual papers

1 Write the lowest common multiple of 6, 12 and 16.

[1 mark]

Answer _____

2 Evaluate 4^0

[1 mark]

Answer _____

3 Order these numbers from smallest to largest

[1 mark]

5.42 5.4̇ 5.402 5.44

Smallest _____ Largest

4 Write the equation that represents the relationship:

c is 3 more than half the square root of d

[1 mark]

Answer _____

7 The manager of a clothes shop records the size of the clothes sold one day.

8				
10	10	10		
12	12	12	12	12
14	14			
16	16	16		
18	18			

(a) Work out the mean size of the clothes sold that day.

[2 marks]

Answer _____

(b) Emily says that the mean is not a very useful average.

Explain what Emily is correct.

[1 mark]

(c) Which average would be the most useful in this example? Explain why.

[2 marks]

8 The speed limit in a village is changed from 30 *mph* to 20 *mph*.
Before the speed limit was changed, it took Beth five minutes to drive through the village.

(a) What distance does Beth travel through the village?

[2 marks]

Answer _____

(b) Mark says that the journey will now take Beth one minute longer.

Is Mark correct?

Show how you decide.

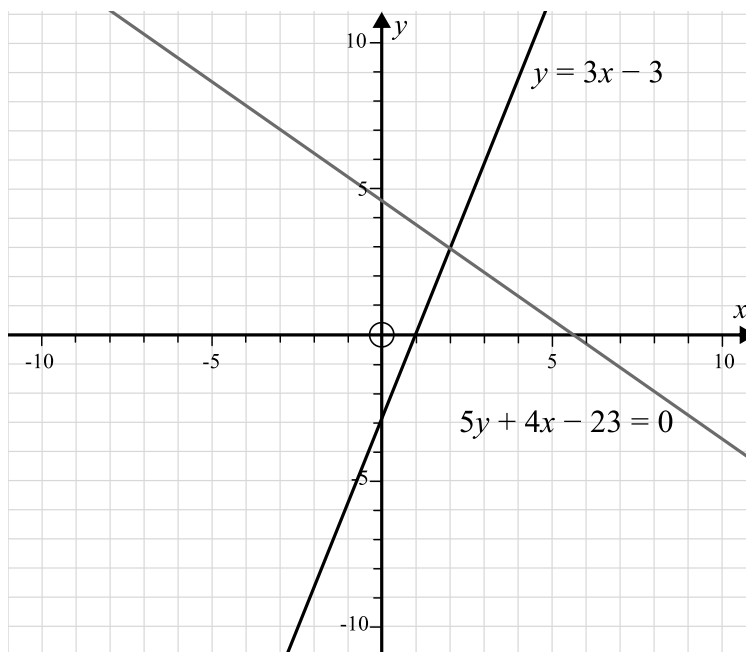
[2 marks]

9 A graph has equation $y = x^n + 2$.
The point (2, 18) lies on the graph.
Determine the value of n .

[1 mark]

Answer _____

10



(a) Use these graphs to solve the simultaneous equations

$$y = 3x - 3$$

$$5y + 4x - 23 = 0$$

[1 mark]

$x =$ _____

$y =$ _____

(b) Work out the gradient of the line $5y + 4x - 23 = 0$

[2 marks]

Answer _____

(c) Are the graphs parallel, perpendicular or neither?

You must show how you decide.

[2 marks]

Parallel

Perpendicular

Neither

- 11 In a bag there are only red counters, blue counters, yellow counters and green counters.
A counter is going to be taken at random from the bag.

The table shows the probability of taking a red counter or a blue counter from the bag.

Colour	red	blue	yellow	green
Probability	0.15	0.25		

The probability of taking a yellow counter is twice the probability of taking a green counter.

- (a) Complete the table.

[2 marks]

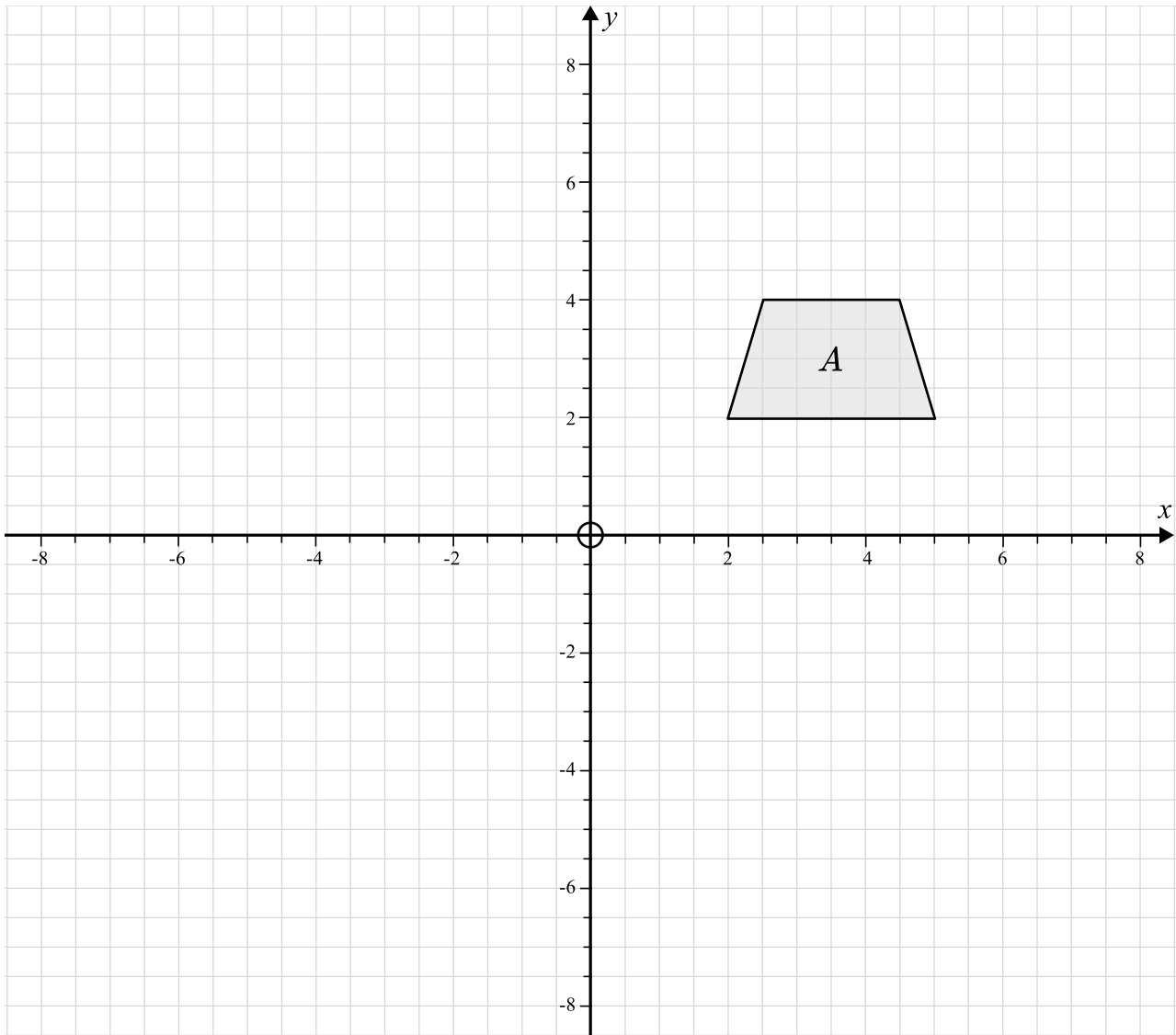
- (b) There are 135 red counters in the bag.

Work out the number of blue counters in the bag.

[2 marks]

Answer _____

12



Shape A is reflected in the line $x = 1$ to give shape B .

Shape B is reflected in the x axis to give shape C .

Describe fully the single transformation which maps shape A onto shape C .

[3 marks]

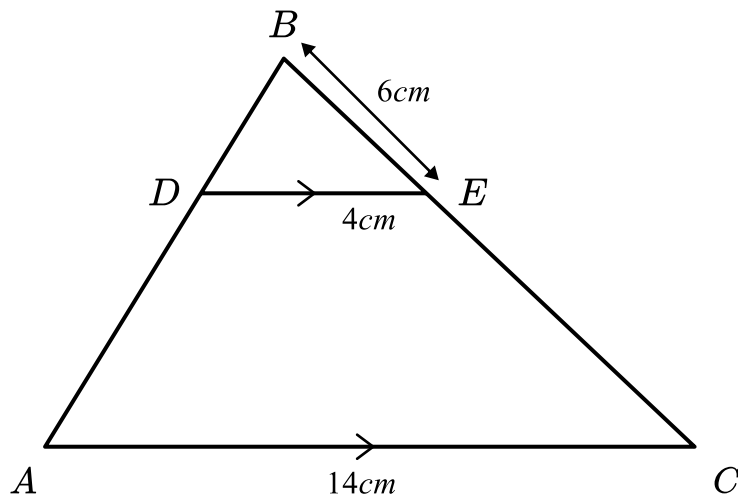
13 Convert 20 metres per second to miles per hour.

Use $5 \text{ miles} = 8 \text{ km}$.

[2 marks]

Answer _____

14 In the diagram, AC is parallel to DE .



$DE = 4\text{cm}$

$AC = 14\text{cm}$

$BE = 6\text{cm}$

Work out the length CE .

[3 marks]

Answer _____

15 $bx^6 = (3x^2)^c$

Work out the values of b and c .

[3 marks]

$b =$ _____ $c =$ _____

16 (a) Peter invests £2000 in a savings account for 3 years.

He is paid compound interest at a rate of 4% per annum.

How much money does Peter have in his account at the end of the 3 years?

[2 marks]

Answer _____

(b) Charlie invests £2000 in a different bank account, which also pays compound Interest.

After 3 years, there is £2275.79 in her account.

Work out the interest rate of Charlie's bank account.

[3 marks]

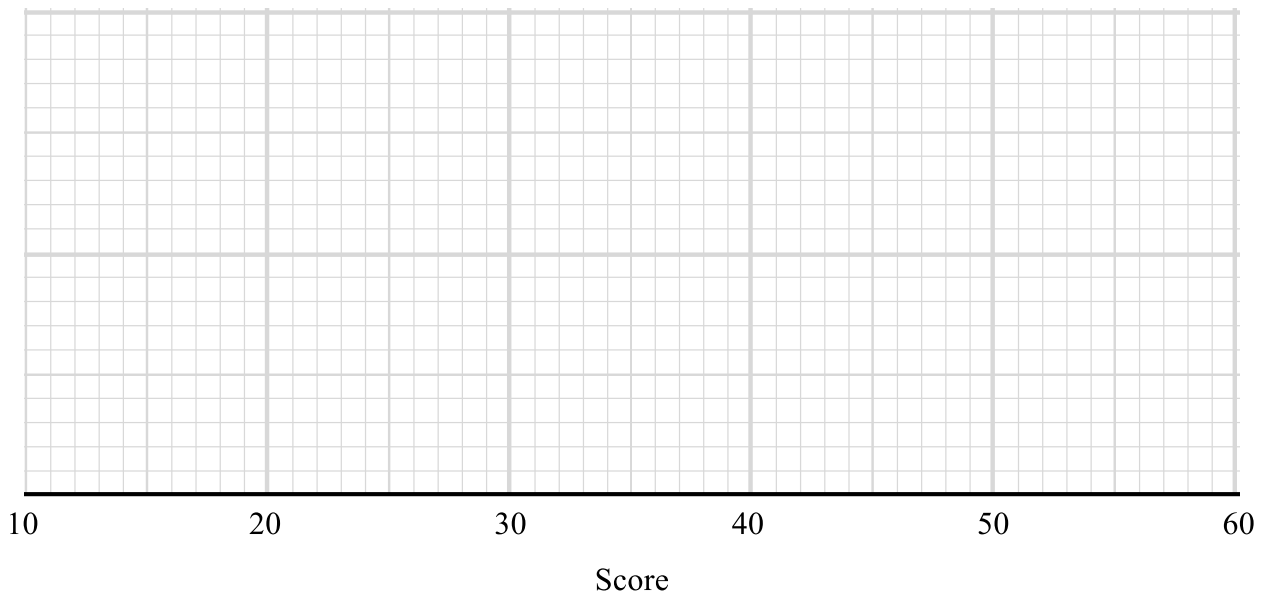
Answer _____

17 Here is some data about the test scores of 27 students in a class. The test scores are out of 60.

11	12	12	15	19	20	21	21	26	27	29
33	33	33	37	39	41	42	43	45	48	49
50	52	53	58	59						

(a) On the grid, draw a box plot for this information.

[3 marks]



(b) Students passed the test if they scored 60% or above.

Find the probability that two students, picked at random, both passed the test.

[3 marks]

Answer _____

18 An approximate solution to an equation is found using the iterative formula

$$x_{n+1} = 0.4x_n + 10 \text{ with } x_1 = 30$$

Work out the values of x_2 and x_3

[2 marks]

$$x_2 = \underline{\hspace{15em}}$$

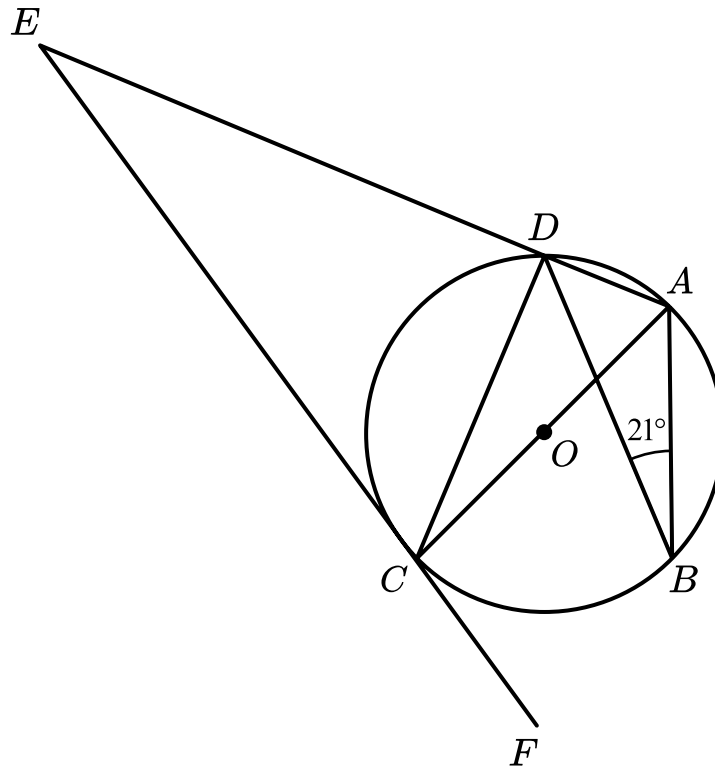
$$x_3 = \underline{\hspace{15em}}$$

19 The ratio $a : a + b$ can be written in the form $1 : k$.

Show that $a = \frac{b}{k-1}$

[3 marks]

20



The points A , B , C and D lie on the circle.

The line EF is a tangent to the circle.

Angle $ABD = 21^\circ$

Work out the size of angle DEC .

You must give a reason for each stage of your working.

[5 marks]

Answer _____

21 Solve the equation $\frac{x + 1}{x - 3} = \frac{x - 7}{3x - 1}$, giving your answers to 2 decimal places.

[5 marks]

Answer _____

22 The area of a field is $2500m^2$ correct to 2 significant figures.

The length of the field is $44m$ to the nearest metre.

Work out the upper bound for the width of the field.

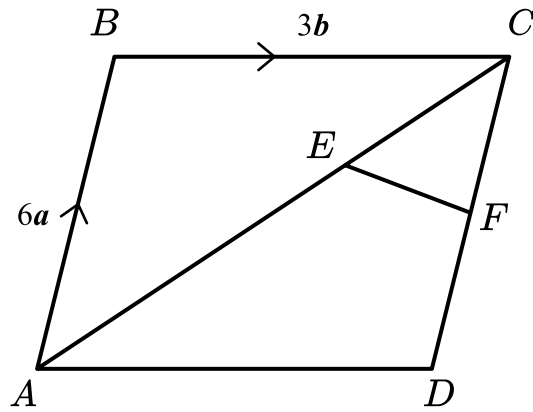
Give your answer to 3 decimal places.

You must show all of your working.

[3 marks]

Answer _____

23



$ABCD$ is a parallelogram.

$$\vec{AB} = 6a$$

$$\vec{BC} = 3b$$

The point E lies on the line AC such that $AE : EC = 2 : 1$

The point F is the midpoint of the line CD .

Work out the vector \vec{EF} vector in terms of a and b .

[4 marks]

Answer _____

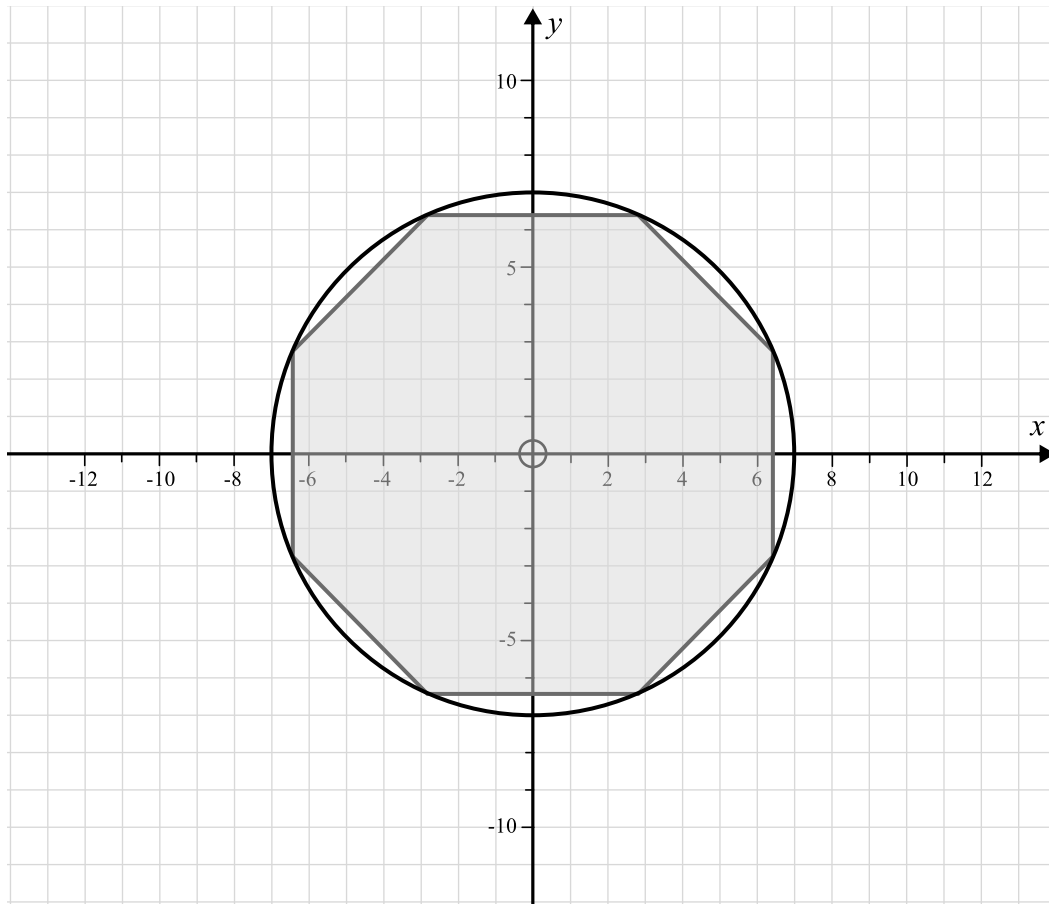
24 $f(x) = x^2 - 3$

$$g(x) = \frac{x-1}{3}$$

Show that $fg(49) = g^{-1}(84)$

[4 marks]

25



A regular octagon is inscribed inside the circle with equation $x^2 + y^2 = 50$.

Show that the area of the octagon is $a\sqrt{2}$ and find the value of a .

[5 marks]

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