

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

GCSE Mathematics

H



Higher

Paper 3

Calculator

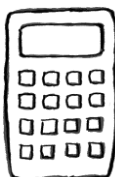
Summer 2018

Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



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 the answer book.

Advice

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

For Examiner's Use

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

Teacher

Class

8300/MissB/3H

Practice Paper Overview

Q	Topic	Mark	Total
1	Multipliers		1
2	Quadratic Equations and Roots		1
3	Nth Term Rule		1
4	Laws of Indices		1
5	Percentage increase and Decrease		3
6	Angles on Parallel Lines		3
7	Averages from a Grouped Table		4
8	Expand Triple Brackets		3
9	Pressure		2
10	Probability and Algebra		4
11	Product of Prime Factors		2
12	Trigonometry		2
13	Equation of a Line		1
14	Area Problem		4
15	Pie Chart		3
16	Form and Solve Equations		4
17	Compound and Simple Interest		4
18	Perimeter of a Sector		3
19	Equation of a Parallel Line		3
20	Product Rule for Counting		2
21	Calculating with Standard Form		2
22	Recognising Graphs		1
23	Circle Theorems		5
24	Quadratic Formula		3
25	Ratio Problem		3
26	Histogram		3
27	Speed, Distance and Time		4
28	Algebraic Fraction		4
29	Quadratic Inequality		4
		Total	80

Answer **all** questions in the spaces provided.

Do not write
outside the
box

- 1 Circle the equation that increases 500 by 1.2%.

[1 mark]

500×1.2

500×1.02

500×1.12

500×1.012

- 2 Circle the equation with roots -3 and 6.

[1 mark]

$(x - 3)(x + 6) = 0$

$x^2 - 18 = 0$

$(x + 3)(x - 6) = 0$

$(x + 3)^2 - 6 = 0$

- 3 Here is a sequence

27

19

11

3

-5

Circle the expression for the n th term of the sequence.

[1 mark]

$8n + 19$

$27 - 8n$

$n - 8$

$35 - 8n$

- 4 Work out $(4x^2)^3$ and circle your answer.

[1 mark]

$64x^6$

$8x^5$

$16x^6$

$12x^6$

- 5** A company makes bags of dog food.
A bag usually contains 5.5kg of food.
Here are two option for a special offer.

Option A

Usual amount of food.
20% off the price.

Option B

15% more food.
Price remains the same.

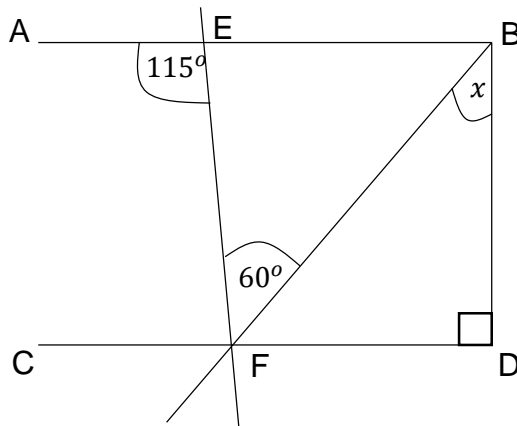
Which option is the better value for the customer?

You must show your working.

[3 marks]

Answer _____

6 AB is parallel to CD.



Not drawn
accurately

Show that angle $x = 35^\circ$

[3 marks]

Answer _____

- 7 Here is some information about the number of hours of revision year 11 students did the night before their maths exam.

One of the frequencies is missing.

Number of hours (t, hours)	Frequency	Midpoint	
$0 \leq t < 1$	14	0.5	
$1 \leq t < 2$	28	1.5	
$2 \leq t < 4$		3	
$4 \leq t < 8$	15	6	

Midpoints are used to work out an estimate for the mean number of hours of revision.

The answer is 2.6

Work out the missing frequency.

[4 marks]

Answer _____

8 Expand and simplify

$$(2x + 4)(x - 3)(3x + 5)$$

[3 marks]

Answer _____

9

$$\text{Pressure} = \frac{\text{force}}{\text{area}}$$

Find the pressure exerted by a force of 1125 newtons on 75cm^2 .Give your answer in newtons/ m^2 **[2 marks]**

Answer _____ newtons/ m^2

- 10 A box contains counters.

	Green	Blue	Purple	Black
Number of counters	16	$2x - 3$	$2x + 5$	$x + 2$

A counter is chosen at random.

The probability it is green is $\frac{8}{50}$.

Work out the probability it is purple.

[4 marks]

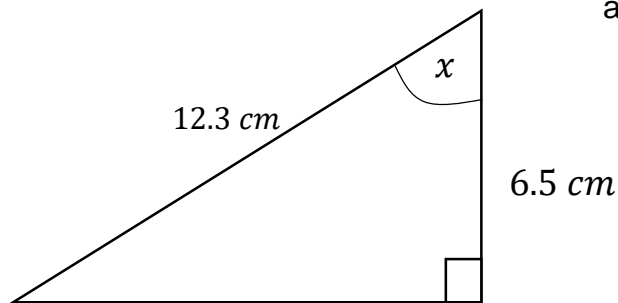
Answer _____

- 11 Express 360 as a product of its prime factors in index form.

[2 marks]

Answer _____

- 12 Calculate the size of the angle marked x .



Not drawn
accurately

[2 marks]

Answer _____

- 13 Circle the equation of the y - axis.

[1 mark]

$x = 0$

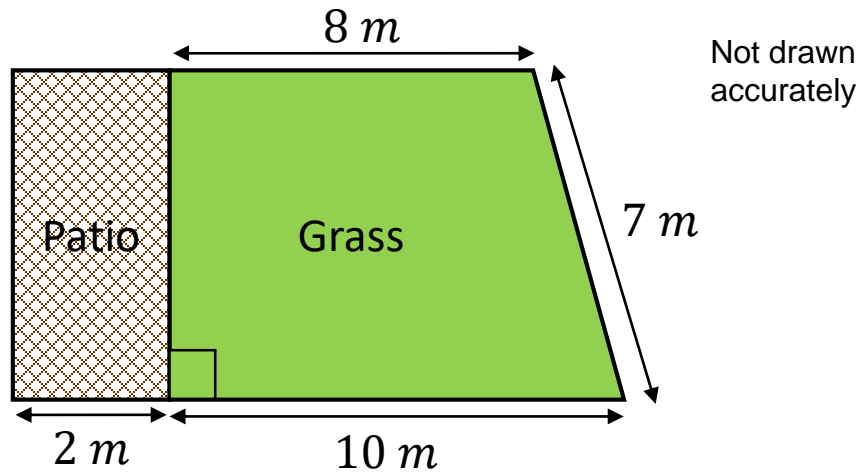
$y - x = 0$

$y = x$

$y = 0$

$y + x = 0$

- 14 The diagram shows a garden.

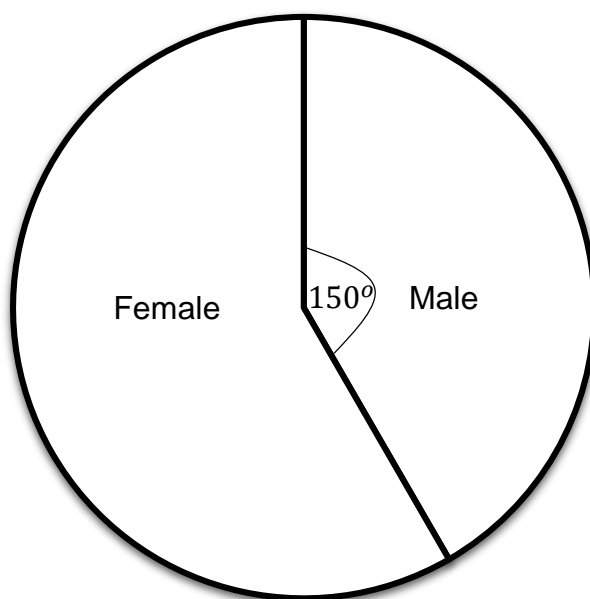


Work out the proportion of the garden area which is covered in grass.

[4 marks]

Answer _____

- 15** The pie chart shows the attendance of males and females at a pop concert.



7740 more females attended than males.

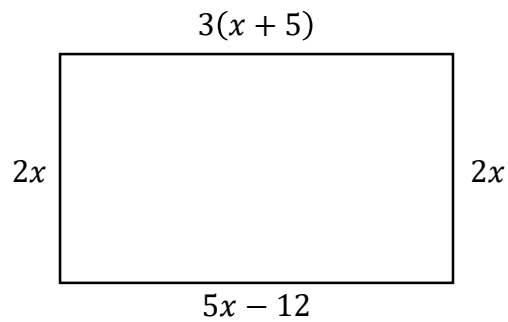
Calculate how many people attended the concert in total.

[3 marks]

Answer _____

16 This is a rectangle.

Each length is measured in centimetres.



Not drawn
accurately

Work out the area of the rectangle.

[4 marks]

Answer _____

17 The value of a house £V is given by

$$V = 125\,000 \times 1.004^t$$

17 (a) Write down the value of the house when $t = 0$

[1 mark]

Answer _____

17(b) What is the value of the house after 4 years?

[1 mark]

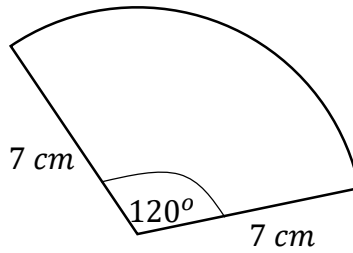
Answer _____

17 (c) After how many years will the house's value be above £130 000

[2 marks]

Answer _____

- 18** Calculate the perimeter of the sector.



Not drawn
accurately

[3 marks]

Answer _____

- 19** Work out the equation of the line that is parallel to the line $y = 4x - 5$ and passes through $(-3, -2)$.

[3 marks]

Answer _____

20 Students on a school trip to an escape room.

To escape the escape room they need a 4 digit code.

Each digit is a number from 0 to 9.

1			
---	--	--	--

They know that the first digit is one.

The second digit is even.

The third digit is prime.

The final number is a square number.

How many potential combinations are there?

[2 marks]

Answer _____

21 Find in standard form the value of

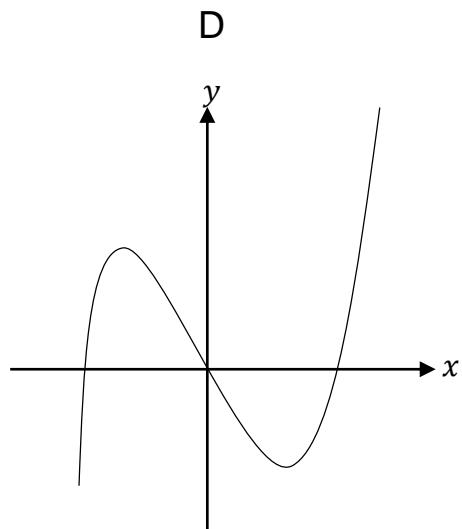
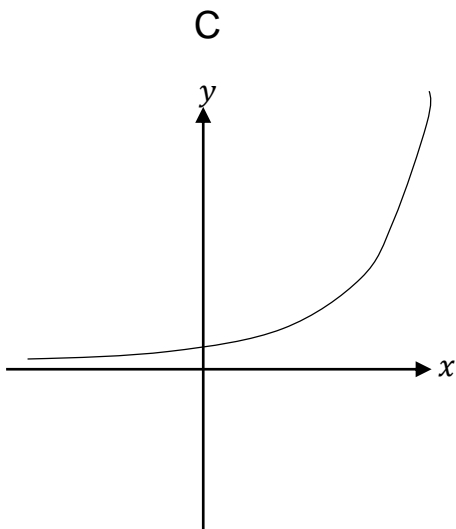
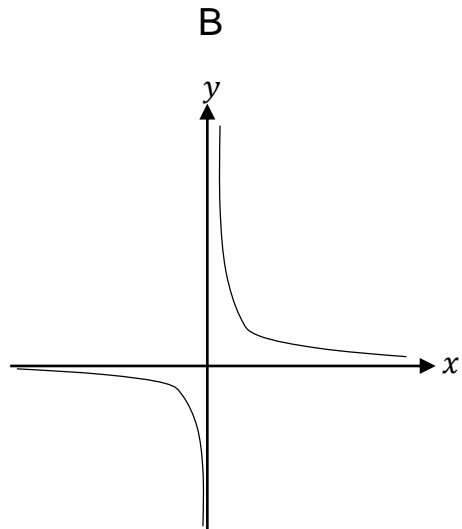
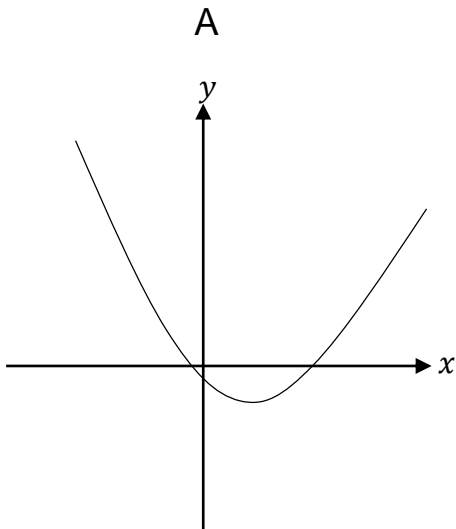
$$(4 \times 10^6) \times (5 \times 10^{-3})$$

[2 marks]

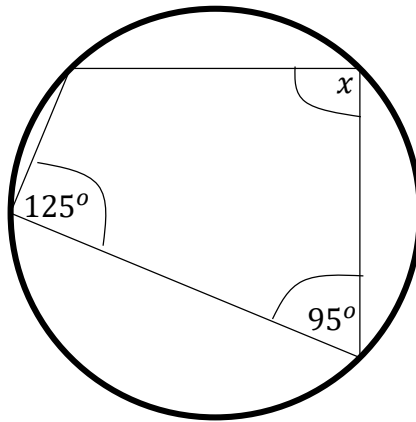
Answer _____

22 Circle the sketch of a cubic graph.

[1 mark]



23



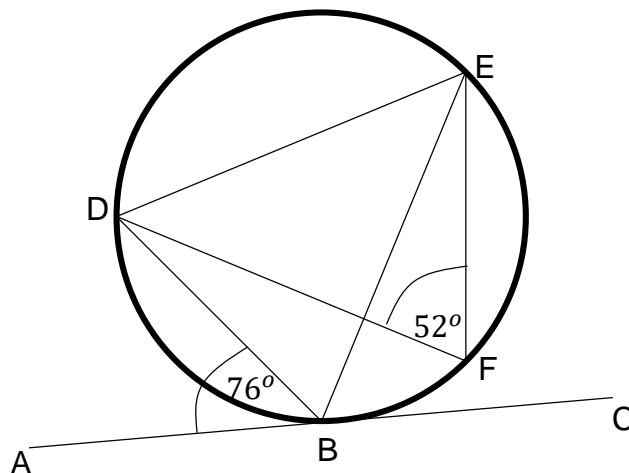
23 (a) Circle the size of angle x .

[1 mark]

 125° 55° 85° 65°

23 (b) Angle $ABD = 76^\circ$ and angle $DFE = 52^\circ$.

The line ABC is a tangent to the circle at point B .



Calculate the size of angle BDE . You must give reasons for your answer.

[4 marks]

Answer _____

24 Use the quadratic formula to solve

$$2x^2 + 11x + 6 = 0$$

[3 marks]

Answers _____

25 In a bag

the number of red and blue counters are in the ratio 3:2

the number of blue and pink counters are in the ratio 7:5

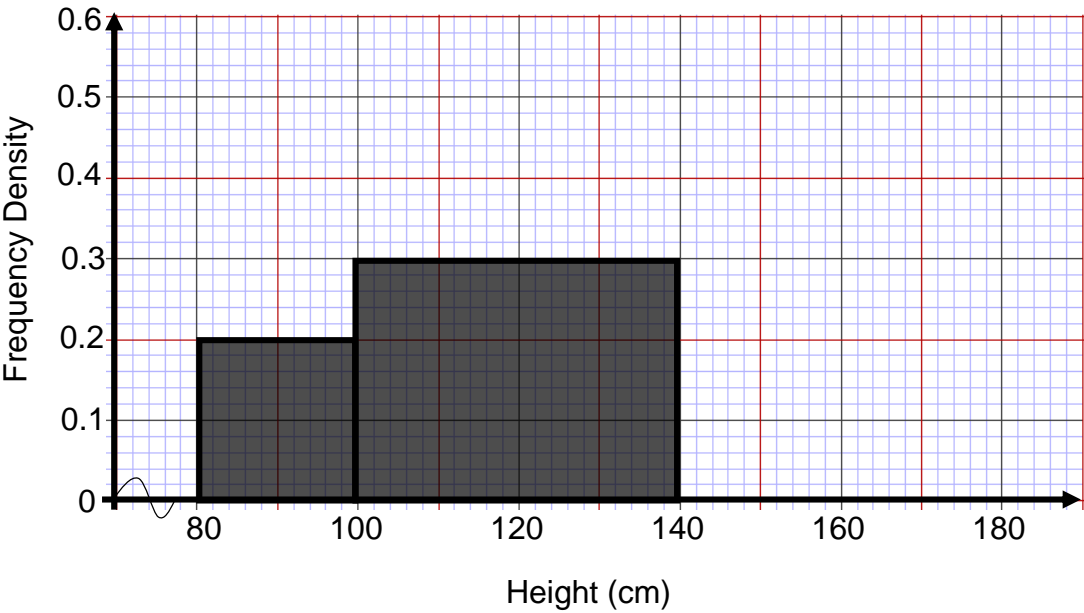
The total number of red, blue and pink counters in the bag is 585.

How many blue counters are in the bag?

[3 marks]

Answers _____

26 The incomplete table and histogram give some information about the height of students in a year 11 class.



26 (a) Use the information in the histogram to complete the frequency table below.

Height (h, cm)	Frequency
$80 < h \leq 100$	
$100 < h \leq 140$	
$140 < h \leq 170$	15
$170 < h \leq 180$	2

[1 mark]

26 (b) Complete the histogram

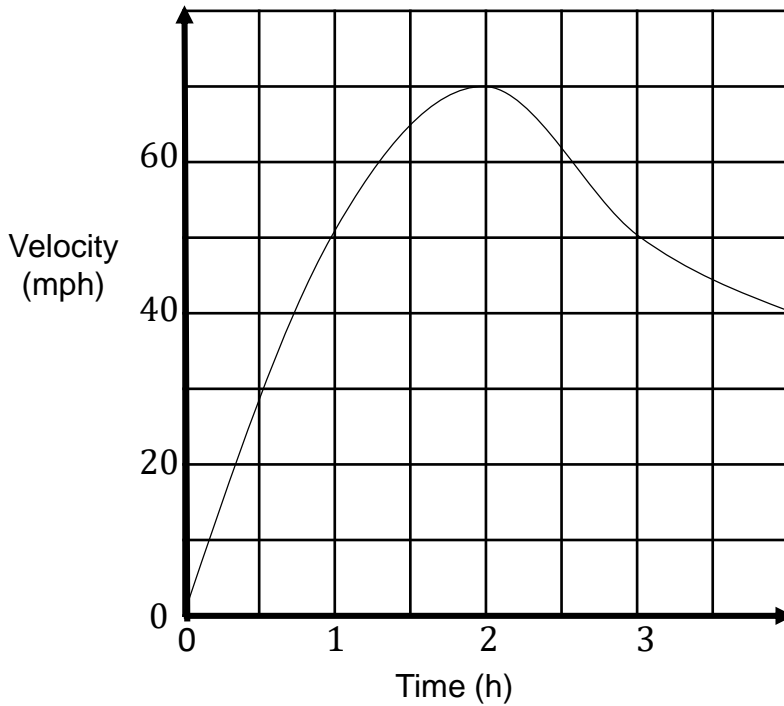
[1 mark]

26 (c) Calculate the proportion of people who are taller than 150cm.

[1 mark]

Answers

27 Here is a velocity-time graph for a coach journey.



27 (a) Work out an estimate for the total distance travelled in the first 3 hours.

[3 marks]

Answer _____

27 (b) Is your answer to (a) an underestimate or an overestimate of the actual distance?

Give a reason for your answer.

[1 mark]

☐

Underestimate

☐

Overestimate

28 Show that

$$\frac{3x+6}{x^2-9} \times \frac{x^2-4x+3}{x^2+x-2}$$

Simplifies to $\frac{a}{bx+c}$ where a, b and c are integers.

[4 marks]

29 Solve the inequality $x^2 < 2(x+4)$

[4 marks]

Answer _____

End of Questions

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