Write your name here

Surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9-1)

Centre Number | | | | | |

Candidate Number | | | | |

Mathematics

Paper 3 (Calculator)

Foundation Tier

Tuesday 12 June 2018 – Morning
Time: 1 hour 30 minutes

Paper Reference
1MA1/3F

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

Total Marks

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.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

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.

Turn over ▶

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6/7/7/7/8/8/7/1/

Pearson

Please note that these worked solutions have neither been provided nor approved by Pearson Education and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue indicates what must be written in order to answer the questions and get the marks. The worked solutions have been designed to show the smallest amount of work which needs to be done to answer the question.

Anything written in green in a cloud doesn't have to be written in the exam.

Anything written in orange in a rectangle doesn't have to be written in the exam and is there to show what should be put into a calculator or measured using a ruler or protractor.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

.CG Maths.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write $\frac{9}{10}$ as a decimal.

Type into calculator and press the SD button

.....

(Total for Question 1 is 1 mark)

2 Write 0.3 as a percentage.

To convert a decimal to a percentage, multiply it by 100

..... %

(Total for Question 2 is 1 mark)

3 Write the number 2538 correct to the nearest hundred.

The nearest 100 is either 2500 or 2600

.....

(Total for Question 3 is 1 mark)

4 Here are the first 4 terms of a sequence.

2 9 16 23

(a) (i) Write down the next term in the sequence.

What is the sequence increasing by each term?

.....

(1)

(ii) Explain how you got your answer.

.....

.....

(1)

(b) Work out the 10th term of the sequence.

The 10th term is 9 after the first term so will have increased by 7 9 times

.....

(1)

(Total for Question 4 is 3 marks)

DO NOT WRITE IN THIS AREA

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DO NOT WRITE IN THIS AREA

5 Here are four digits.

7 3 4 9

(a) Use three of these digits to write down the largest possible 3-digit number.

The largest digits should be used first

.....

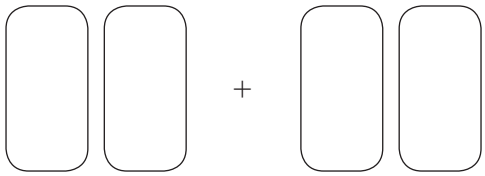
(1)

(b) Here are four different digits.

8 2 1 6

Put one of these digits in each box to give the smallest possible answer to the sum.
You must use each digit only once.

The smallest digits should be used first for each number to keep the sum as low as possible



(1)

(Total for Question 5 is 2 marks)

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6 Write down all the factors of 30

Whole numbers 30 can be divided by

Write the factors in pairs starting with the smallest

.....

(Total for Question 6 is 2 marks)

---

7 David has twice as many cousins as Becky.
Becky has twice as many cousins as Nishat.

Nishat has 6 cousins.

How many cousins does David have?

6 x 2 works out how many cousins Becky has. Multiplying this by 2 works out how many David has

.....

(Total for Question 7 is 2 marks)

---

8 (a) Find the value of $\sqrt{1.44 \times 3.61}$

Type into calculator

.....

(1)

(b) Find the value of $(3.54 - 0.96)^2 - 4.096$

Type into calculator

.....

(2)

(Total for Question 8 is 3 marks)

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9 This is part of a bus timetable between Bury and Manchester.

Bury	08 25	08 55	09 15	09 30	09 45	10 05
Whitefield	08 34	09 04	09 24	09 39	09 54	10 14
Heaton Park	08 46	09 16	09 36	09 51	10 06	10 27
Cheetham	08 56	09 26	09 46	10 01	10 16	10 37
Manchester	09 05	09 35	09 55	10 10	10 25	10 48

(a) How many minutes should the 08 25 bus take to go from Bury to Manchester?

FACT B
° ' "
9°05° - 8°25°
Press the button on the left to get the °

..... minutes
(1)

Daniel goes from Whitefield to Manchester by bus.

Daniel takes 17 minutes to get from his house to the bus stop in Whitefield.
He takes 15 minutes to get from the bus stop in Manchester to work.

Daniel has to get to work by 10 am.
He leaves his house at 8.45 am.

(b) Does Daniel get to work by 10 am?
You must show all your working.

Start by working out what time is 17 minutes after 8.45am.
This is the time he gets to the bus stop in Whitefield.

Look at the timetable to see what bus he can get next and what time that arrives at Manchester.

Add 15 minutes to this time to work out what time he should get to work

(3)

(Total for Question 9 is 4 marks)

10 Bronwin works in a restaurant.

The table gives her rates of pay.

Day	Rate of pay
Monday to Friday	£8.40 per hour
Weekend	£11.20 per hour

Bronwin worked for a total of 20 hours last week.
She worked 8 of these 20 hours at the weekend.

Show that Bronwin was paid less than £200 last week.

There are 20 hours in total so subtracting the 8 hours he did on the weekend leaves the hours he did Monday to Friday.

Multiplying the hourly rate by the number of hours worked gives the amount earned

(Total for Question 10 is 3 marks)

11 Last year the cost of a season ticket for a football club was £560
This year the cost of a season ticket for the club has been increased to £600

Write down the increase in the cost of a season ticket as a fraction of last year's cost.

$$\frac{\text{Increase in the cost of a season ticket}}{\text{last year's cost}}$$

.....

(Total for Question 11 is 2 marks)

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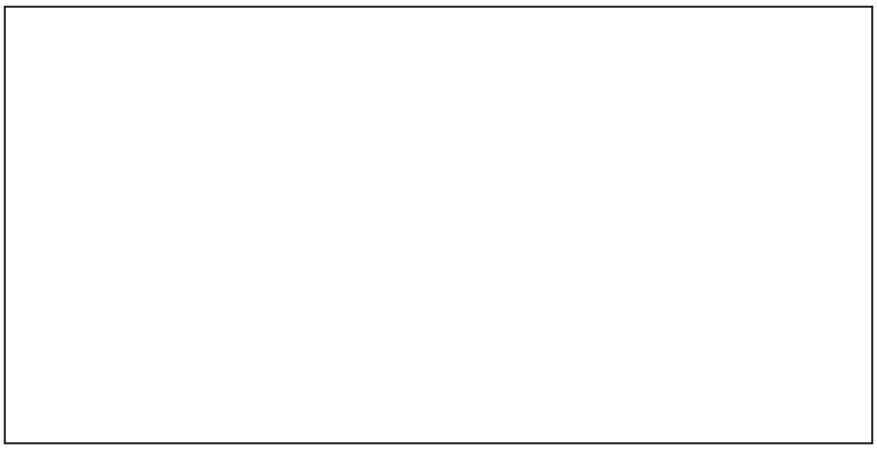
12 The diagram shows a scale drawing of a tennis court.



The scale of the drawing is 1 : 200

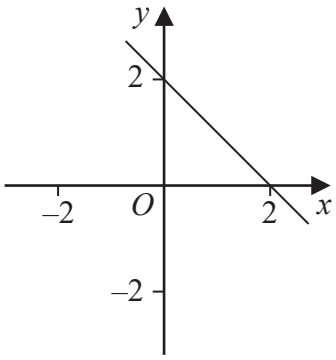
Work out the perimeter of the real tennis court.
Give your answer in metres.

Adding all the lengths of the rectangle gives the perimeter of the drawing. The real tennis court is 200 times larger than the drawing. Remember to convert the centimetres to metres at the end

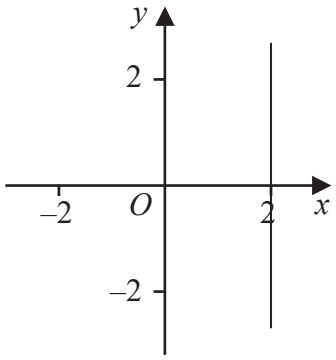
..... metres

(Total for Question 12 is 5 marks)

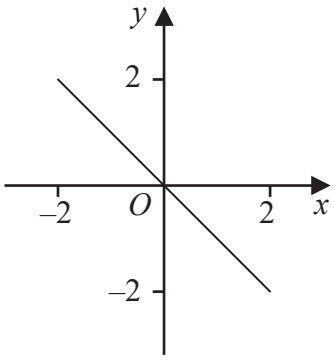
13 Here are six straight line graphs.



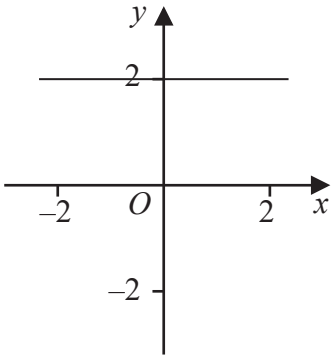
Graph **A**



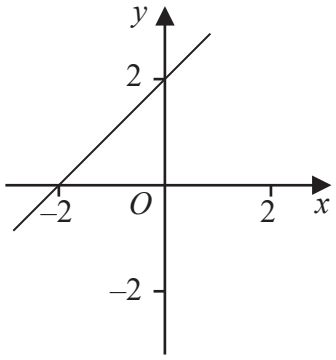
Graph **B**



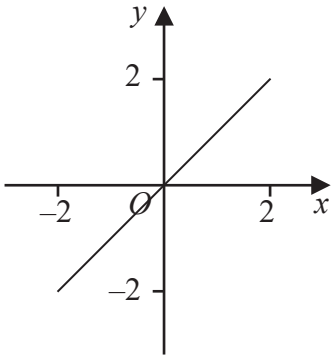
Graph **C**



Graph **D**



Graph **E**



Graph **F**

Match each equation in the table to the correct graph.
Write the letter of the graph in the table.

Equation	Graph
$y = 2$	
$y = x$	
$x + y = 2$	

Check the graphs one by one for each equation. See if all of the coordinates satisfy the equation

(Total for Question 13 is 2 marks)

14 Here are the marks 20 students got in a French test.

76	82	84	69	80	64	70	81	75	91
87	67	80	70	94	76	81	69	71	77

(a) Show this information in a stem and leaf diagram.

Put the numbers in the diagram starting from smallest to largest. It is best to cross the numbers off as we go to avoid counting any numbers twice

6	4 7

Key:
6 | 4 = 64

(3)

One of these students is going to be chosen at random.

The pass mark in the French test is 71

Omar writes,

The probability that this student failed the French test is $\frac{1}{4}$

Omar is wrong.

(b) Explain why.

Write the number of students who failed as a fraction of 20. The fraction shouldn't be equivalent to 1/4

(2)

(Total for Question 14 is 5 marks)

DO NOT WRITE IN THIS AREA

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DO NOT WRITE IN THIS AREA

15 Jenny is asked to find the value of $12 - 2 \times 4$

Here is her working.

$$12 - 2 \times 4 = 10 \times 4 = 40$$

Jenny's answer is wrong.

(a) Explain what Jenny has done wrong.

BIDMAS is the order of operations and it has not been followed correctly

(1)

Rehan is asked to find the range of the numbers 3 1 8 7 5

Here is his working.

$$\text{Range} = 5 - 3 = 2$$

This is wrong.

(b) Explain why.

State what the range is

(1)

(Total for Question 15 is 2 marks)

16 Alan, Bispah and Chan share a sum of money.

Alan gets $\frac{1}{8}$ of the money.

Bispah gets $\frac{1}{2}$ of the money.

Chan gets the rest of the money.

Alan gets £2.50

(a) Work out how much money Bispah gets.

First work out how much money there is in total. £2.50 is 1/8 of the money. Then work out 1/2 of the total

£.....

(2)

(b) Find the ratio

amount of money Alan gets : amount of money Chan gets

Give your answer in the form $a : b$ where a and b are whole numbers.

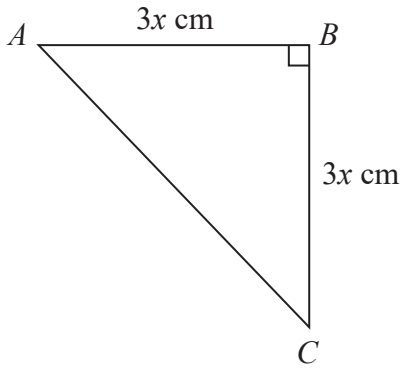
Work out how much money Chan gets by subtracting the amount the others get from the total amount of money. Then write the amount of money Alan gets to the amount Chan gets as a ratio. The ratio needs to be simplified (to do this, multiply or divide both sides of the ratio by the same amount) to eliminate the decimals but it doesn't need to be in the simplest form

.....

(3)

(Total for Question 16 is 5 marks)

17 ABC is an isosceles right-angled triangle.



The area of the triangle is $162\,cm^2$

Work out the value of x.

Area of triangle = 1/2 x base x height
The base and height of the triangle are both 3x. Use this to make an equation in terms of x which can be rearranged and solved

$x =$ .....

(Total for Question 17 is 3 marks)

18 Work out the value of $\dfrac{2.645 \times 10^9}{1.15 \times 10^3}$

Type this into the calculator to get an ordinary number

Give your answer in standard form.

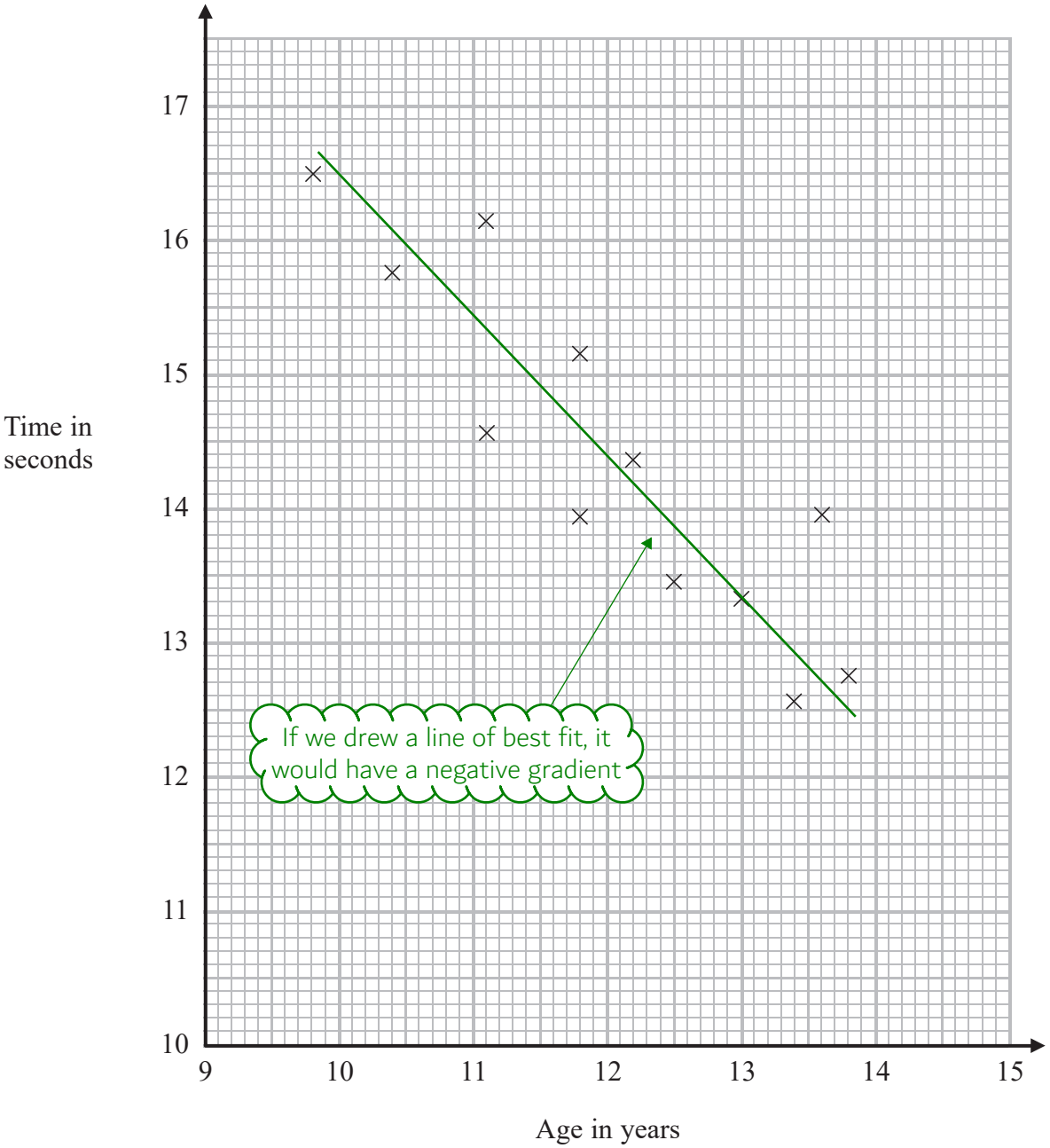
$a \times 10^n$, where $1 \leq a < 10$ and n is a whole number

.....

(Total for Question 18 is 2 marks)

19 The scatter diagram shows information about 12 girls.

It shows the age of each girl and the best time she takes to run 100 metres.



(a) Write down the type of correlation.

Positive, negative or none

.....

(1)

Kristina is 11 years old.
Her best time to run 100 metres is 12 seconds.

The point representing this information would be an outlier on the scatter diagram.

(b) Explain why.

Plot the point on the graph and look where it is relative to the other points

(1)

Debbie is 15 years old.
Debbie says,

"The scatter diagram shows I should take less than 12 seconds to run 100 metres."

(c) Comment on what Debbie says.

The downward trend might not continue

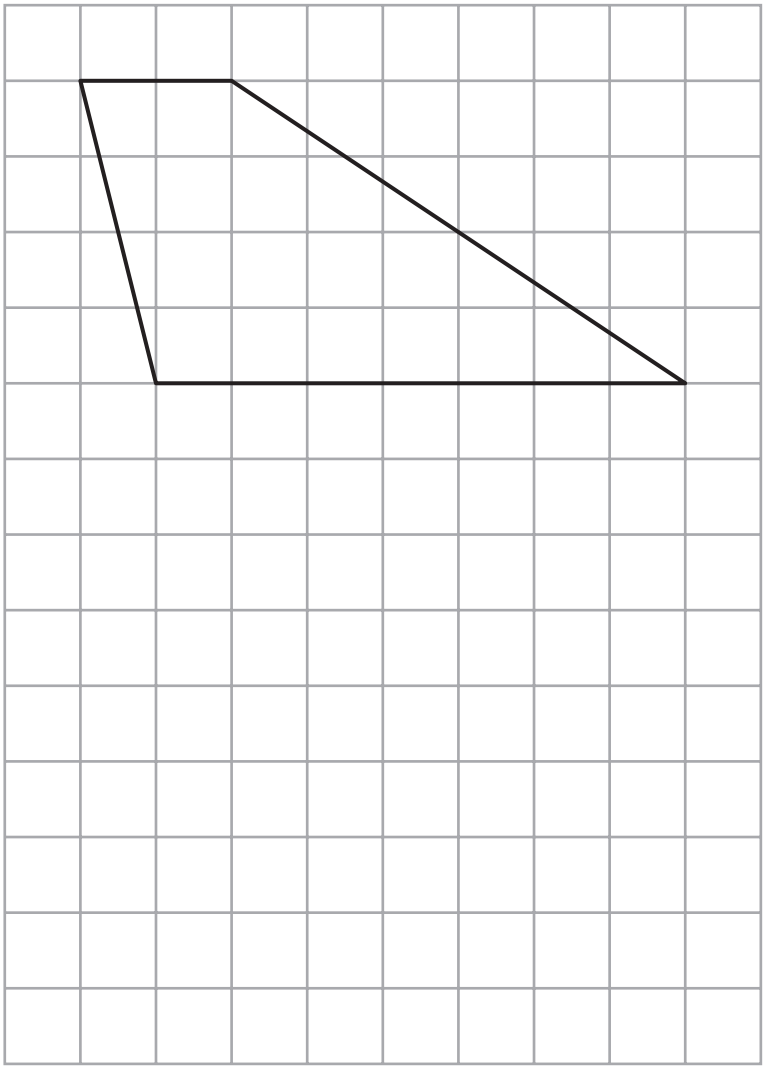
(1)

(Total for Question 19 is 3 marks)

20 Expand and simplify $5(p + 3) - 2(1 - 2p)$

(Total for Question 20 is 2 marks)

21 Here is a trapezium drawn on a centimetre grid.



On the grid, draw a triangle equal in area to this trapezium.

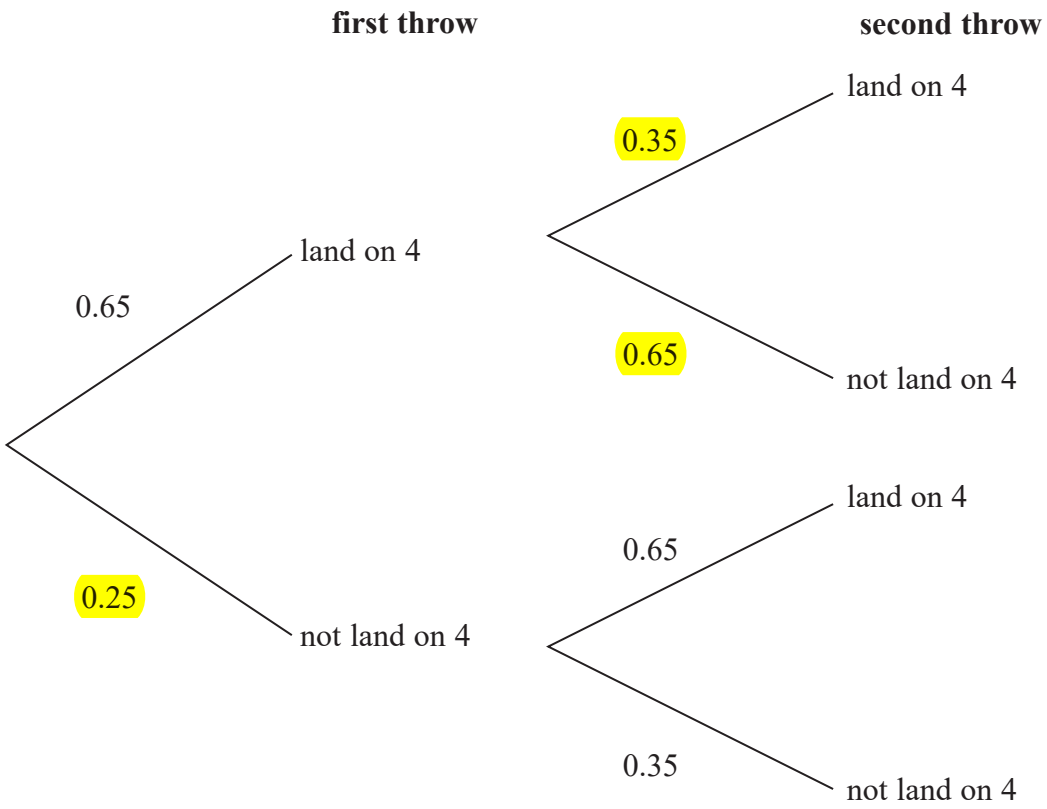
Area of trapezium = 1/2 x (a + b) x h, where a and b are the parallel sides and h is the distance between a and b.

Area of triangle = 1/2 x base x height

(Total for Question 21 is 2 marks)

22 When a biased 6-sided dice is thrown once, the probability that it will land on 4 is 0.65
The biased dice is thrown twice.

Amir draws this probability tree diagram.
The diagram is **not** correct.



Write down **two** things that are wrong with the probability tree diagram.

1 .....

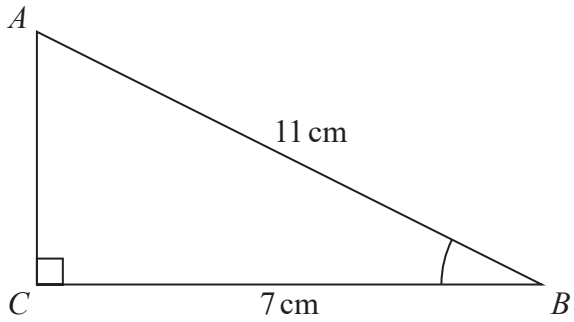
.....

2 .....

.....

(Total for Question 22 is 2 marks)

23 ABC is a right-angled triangle.



(a) Work out the size of angle ABC.
Give your answer correct to 1 decimal place.

SOH CAH TOA

Tick what sides we have (hypotenuse is the longest side, adjacent is the one next to the angle, opposite is opposite the angle). If there are two ticks, we can use that formula triangle. Write out the formula triangle and cover over what we are trying to find to get a formula involving the angle. Rearrange to find the angle

.....°

(2)

The length of the side AB is reduced by 1 cm.

The length of the side BC is still 7 cm.
Angle ACB is still 90°

(b) Will the value of cos ABC increase or decrease?
You must give a reason for your answer.

Cos ABC = adjacent/hypotenuse

.....

.....

(1)

(Total for Question 23 is 3 marks)

DO NOT WRITE IN THIS AREA

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DO NOT WRITE IN THIS AREA

24 There are some counters in a bag.
The counters are red or white or blue or yellow.

Bob is going to take at random a counter from the bag.

The table shows each of the probabilities that the counter will be blue or will be yellow.

Colour	red	white	blue	yellow
Probability			0.45	0.25

There are 18 blue counters in the bag.

The probability that the counter Bob takes will be red is twice the probability that the counter will be white.

(a) Work out the number of red counters in the bag.

2:1 ← This is the ratio of red to white

It is certain to get one of the colours so all the probabilities must add to 1. Therefore subtracting the probabilities of blue and yellow away from 1 leaves the probability of red or white.

There are 3 parts in total in the ratio. These represent red or white and the total probability of these. Divide the total probability of red or white into the ratio to find the probability of getting red.

Let x be the total number of counters. The probability is equal to the relative frequency so therefore 0.45 of the total is 18. Set up an equation in terms of x using this and then rearrange it to find x.

Multiply the probability of getting red by the total number of counters to find how many red counters there are

.....

(4)

A marble is going to be taken at random from a box of marbles.
The probability that the marble will be silver is 0.5

There must be an even number of marbles in the box.

(b) Explain why.

If the probability is 0.5, half of the marbles must be silver. Consider what this would mean if there was an odd number of marbles

.....

.....

(1)

(Total for Question 24 is 5 marks)

25 Solve $\frac{5-x}{2} = 2x - 7$

First eliminate the fraction by multiplying both sides by the denominator.

Bring all the x terms to the same side and move all the non-x terms to the other side. Then make x the subject

$x =$ .....

(Total for Question 25 is 3 marks)

DO NOT WRITE IN THIS AREA

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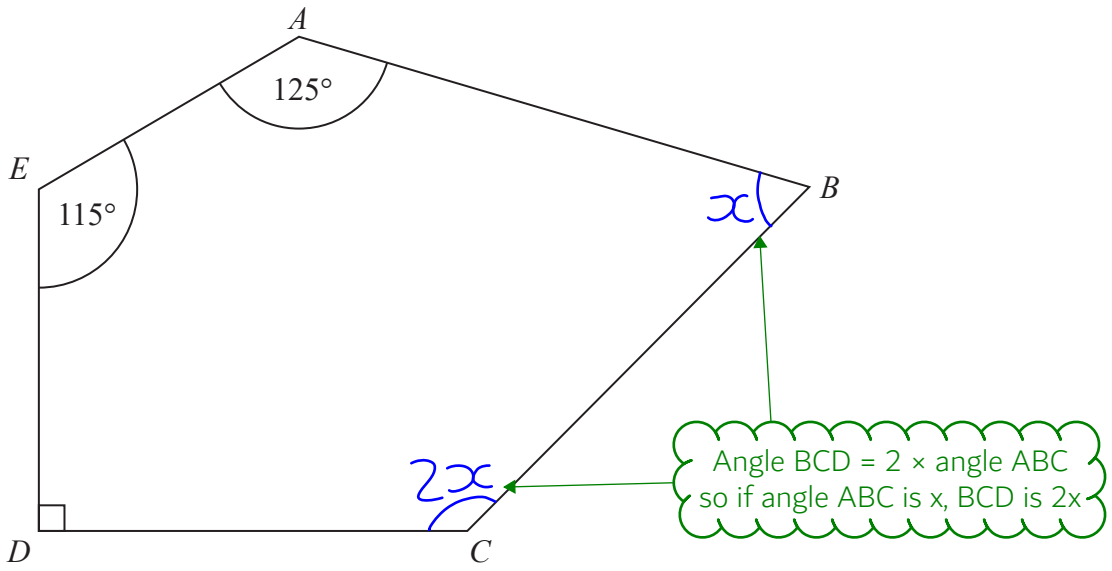
DO NOT WRITE IN THIS AREA

26 *ABCDE* is a pentagon.



Angle *BCD* = 2 × angle *ABC*

Work out the size of angle *BCD*.
You must show all your working.

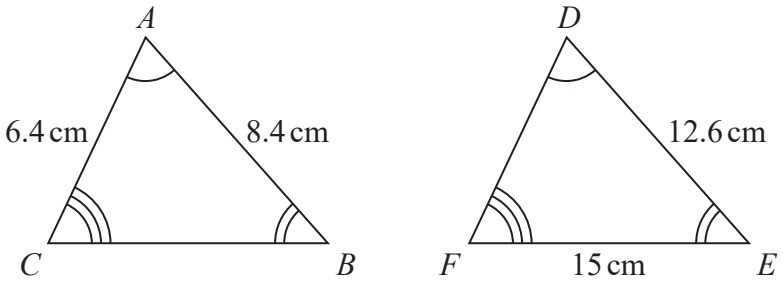
(n - 2) x 180 is the formula for the total number of degrees in a polygon, where n is the number of sides.

Adding all the angles in the shape gives the total number of degrees. Using this, create an equation in terms of x which can be rearranged and solved

.....°

(Total for Question 26 is 5 marks)

27 Triangle ABC and triangle DEF are similar.



(a) Work out the length of DF.

All the sides on the left triangle have been multiplied by a scale factor to give the sides on the right triangle. Work out what this is then multiply side AC by it to get side DF

..... cm

(2)

(b) Work out the length of CB.

Divide FE by the scale factor

..... cm

(2)

(Total for Question 27 is 4 marks)

28 Make g the subject of the formula $T = \sqrt{\frac{g+6}{2}}$

Everything on the right side needs to go apart from g. The square root needs to be dealt with first, then the division then the addition

.....

(Total for Question 28 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS