Write your name here

Surname		Other names

Centre Number

Candidate Number

Mathematics A
Paper 1FR

Foundation Tier

Monday 9 January 2017 – Morning
Time: 2 hours

Paper Reference
4MA0/1FR

You must have:
Ruler graduated in centimetres and millimetres, protractor, 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.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
  – *there may be more space than you need*.
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.
  Anything you write on the formulae page will gain NO credit.

Information

- The total mark for this paper is 100.
- 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.
- Check your answers if you have time at the end.
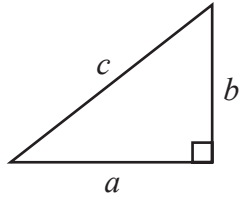
Turn over ▶
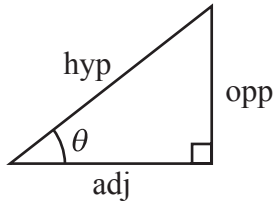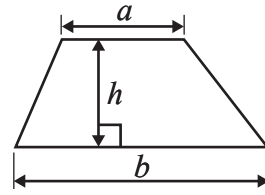
P 4 8 4 0 3 A 0 1 2 4

Pearson

FORMULAE SHEET – FOUNDATION TIER

Pythagoras'
Theorem
$a^2 + b^2 = c^2$

Area of a trapezium $= \frac{1}{2}(a + b)h$

$adj = hyp \times \cos \theta$
$opp = hyp \times \sin \theta$
$opp = adj \times \tan \theta$

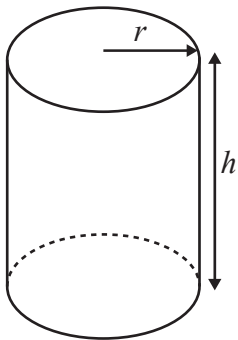Volume of prism = area of cross section $\times$ length

or $\sin \theta = \dfrac{opp}{hyp}$

$\cos \theta = \dfrac{adj}{hyp}$

$\tan \theta = \dfrac{opp}{adj}$
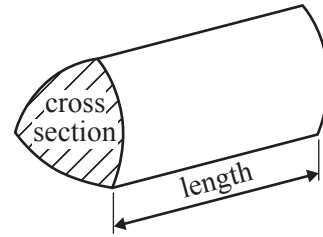
Circumference of circle $= 2\pi r$

Area of circle $= \pi r^2$

Volume of cylinder $= \pi r^2 h$

Curved surface area
of cylinder $= 2\pi rh$

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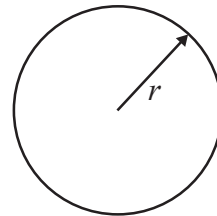
Answer ALL TWENTY questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 (a) (i) What fraction of this shape is shaded?

....
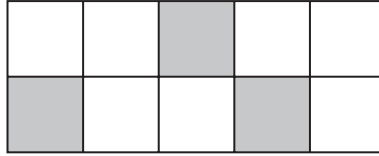
(ii) Write your fraction as a decimal.

....

(2)

(b) Find a fraction that is equivalent to $\dfrac{2}{7}$

....

(1)

(c) Write 65% as a decimal.

....

(1)

72% of a shape is coloured red.
The rest of the shape is coloured blue.

(d) What percentage of the shape is coloured blue?

....%

(1)

(Total for Question 1 is 5 marks)

2 Jan recorded the number of steps she took each day last week.
This information is shown in the table.

Day	Number of steps
Monday	9780
Tuesday	4853
Wednesday	12038
Thursday	15243
Friday	4695
Saturday	4801
Sunday	11856

(a) On which day did she take the least number of steps?

....

(1)

(b) Write the number 12038 in words.

....

....

(1)

(c) Round the number 4853 correct to the nearest hundred.

....

(1)

Two of the numbers in the table are multiples of 5

(d) Write down these two numbers.

.... , ...

(2)

Jan takes 1200 steps to walk one kilometre.

(e) Use this information to work out how many kilometres Jan walked on Thursday.
Give your answer correct to the nearest kilometre.

.... kilometres

(2)

(f) Work out the mean number of steps per day Jan took last week.

....
(2)

(Total for Question 2 is 9 marks)

3
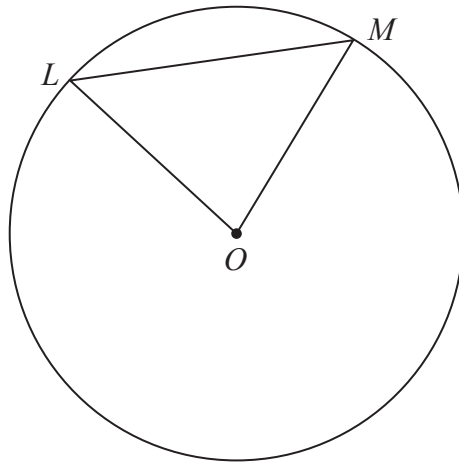
L and *M* are points on a circle, centre *O*.

(a) Write down the mathematical name for the straight line *OM*.

....
(1)

(b) Write down the mathematical name for the straight line *LM*.

....
(1)

(c) On the diagram, shade a segment.
(1)

(Total for Question 3 is 3 marks)

P 4 8 4 0 3 A 0 5 2 4

4 The bar chart shows information about the population of each of five countries in 2013
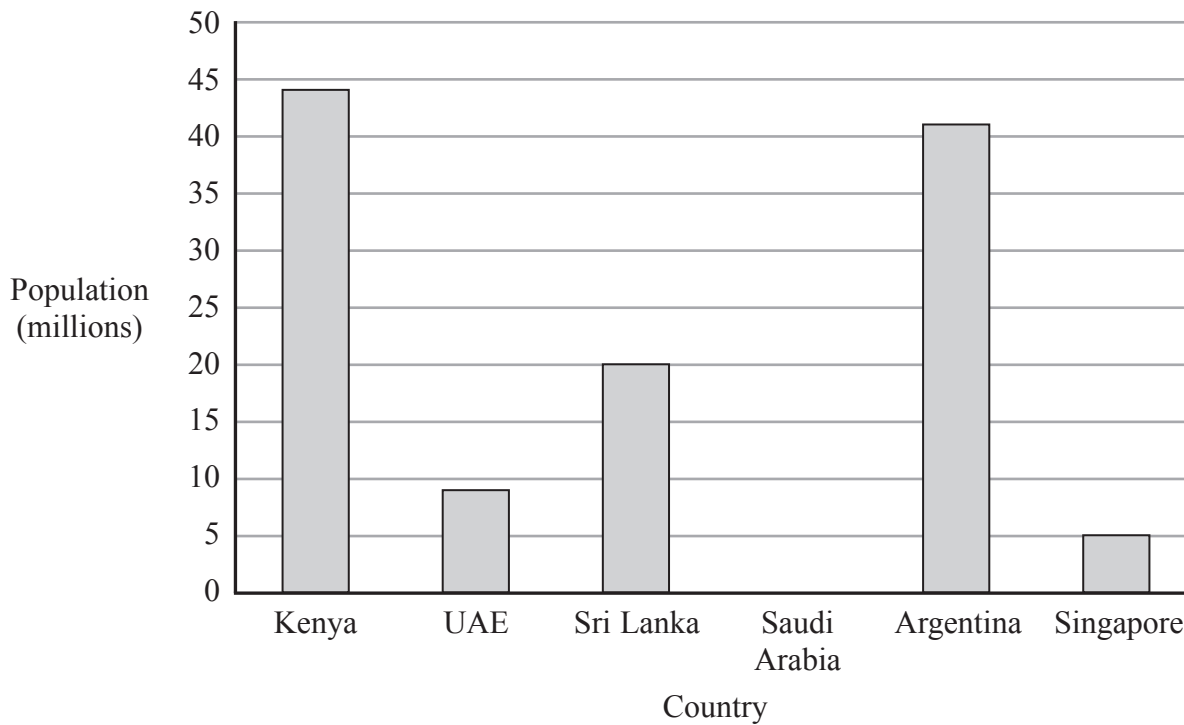
(a) Write down the population of Sri Lanka.

.... million

(1)

(b) Write down the population of the UAE.

.... million

(1)

(c) Which country had a population of 41 million?

....

(1)

Suki says,

"In 2013, the population of Singapore was $\frac{1}{5}$ of the population of Sri Lanka."

(d) Is Suki correct?
You must give a reason for your answer.

....

....

(1)

In 2013, the population of Saudi Arabia was 29 million.

(e) Draw a bar on the bar chart to show this information.

(1)

In 2013, the ratio of the population of India to the population of the UK, in millions, was 1252 : 64

(f) Write the ratio 1252 : 64 in its simplest form.

....

(2)

(Total for Question 4 is 7 marks)

5 (a) Write down a prime number between 20 and 40

....

(1)

(b) Work out the cube of 7

....

(1)

(Total for Question 5 is 2 marks)

6 (a) Change 8 metres into centimetres.

.... centimetres
(1)

(b) Change 9500 cm³ into litres.

.... litres
(1)

(c) Complete the sentence by writing a suitable metric unit on the dotted line.

The weight of a car is 2500 ....
(1)

A train arrived in Islamabad at 23 45

(d) Write 23 45 as a time using the 12-hour clock.

....
(1)

Jim goes to sleep at 9 30 pm.
He wakes up the next morning at 7 15 am.

(e) For how long did Jim sleep?

....
(2)

The area of the floor of a room is 12 m²

(f) Change 12 m² into cm²

.... cm²
(2)

(Total for Question 6 is 8 marks)

7 Here are 8 cards.
Each card has a letter on it.

| A | A | A | B | C | C | C | C |

Malik takes at random one of these cards.

| impossible | unlikely | evens | likely | certain |
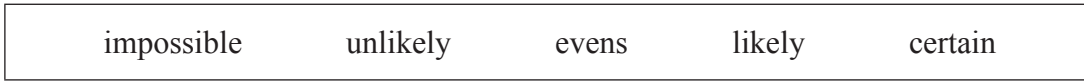
(a) Write down the word from the box that best describes the likelihood that Malik takes

 (i) a card with the letter **B**,

....

 (ii) a card with the letter **D**.

....

(2)

(b) Find the probability that Malik takes a card with the letter **A**.

....

(2)

Sunil has two sets of cards, Set 1 and Set 2
Each card has a letter on it.

| E | F | G | | W | X |

Set 1   **Set 2**

Sunil takes one card from Set 1
He then takes one card from Set 2

(c) List all the possible combinations of cards he could get.

....

....

....

(2)

(Total for Question 7 is 6 marks)

P 4 8 4 0 3 A 0 9 2 4

8 (a) Simplify $p + p + p + p - p$

....
(1)

(b) Simplify $6 \times e \times 5 \times f$

....
(1)

(c) Solve $8m = 40$

$m =$ ....
(1)

(d) Solve $20 - k = 16$

$k =$ ....
(1)

$a = 3c + f$

(e) Work out the value of c when $a = 23$ and $f = 5$

$c =$ ....
(3)

(Total for Question 8 is 7 marks)

9 You can use this graph to change between pounds (£) and Hong Kong dollars (HKD).
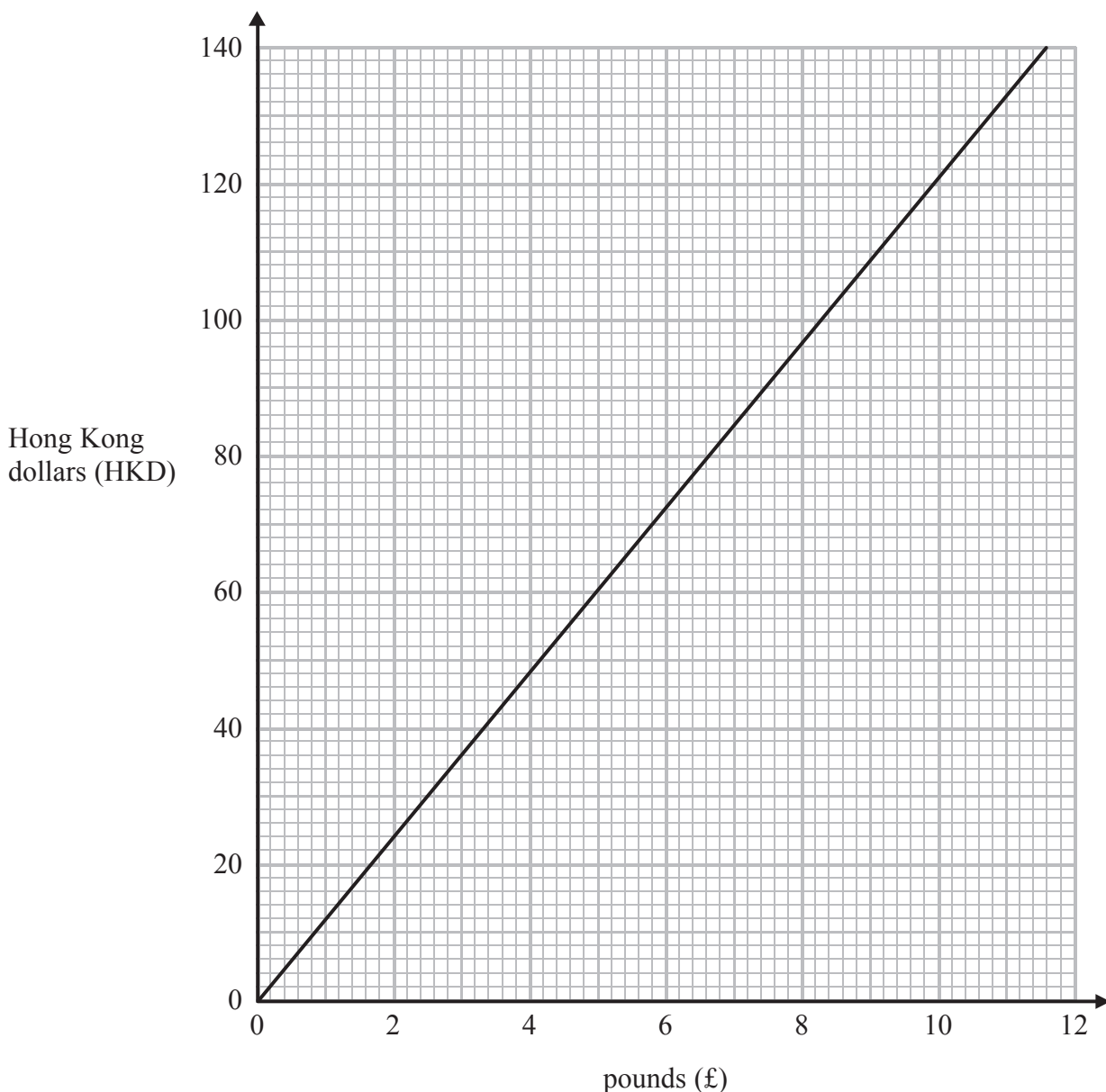
(a) Change 120 Hong Kong dollars into pounds.

£..

(1)

(b) Change £6 into Hong Kong dollars.

.... HKD

(1)

(c) Change 1000 Hong Kong dollars into pounds.

£..

(2)

(Total for Question 9 is 4 marks)

P 4 8 4 0 3 A 0 1 1 2 4

10 (a) Work out $\dfrac{2}{9}$ of 738 kg.

.... kg

There are 24 horses in a field.
17 of the horses are brown.

(b) What fraction of the horses in the field are **not** brown?

....

(2)

(c) Show that $\dfrac{10}{21} - \dfrac{1}{3} = \dfrac{1}{7}$

(2)

(Total for Question 10 is 6 marks)

11
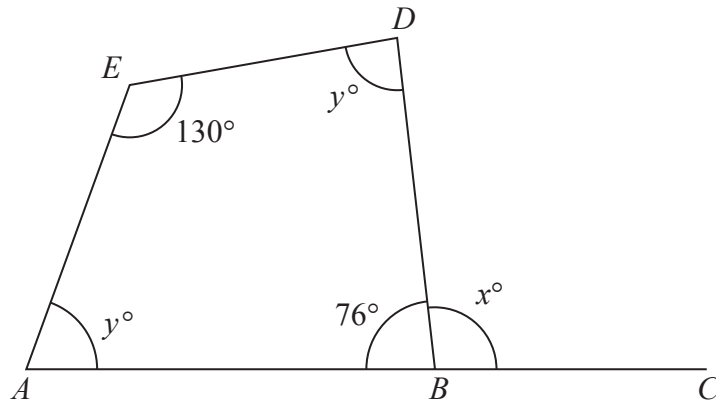

Diagram **NOT** accurately drawn

ABC is a straight line.
ABDE is a quadrilateral.

(a) (i) Work out the value of *x*.

x = ...

(ii) Give a reason for your answer.

....

....

(2)

(b) Work out the value of *y*.

y = ...

(3)

Each exterior angle of a regular polygon is 18°

(c) Work out the number of sides of this regular polygon.

....

(2)

(Total for Question 11 is 7 marks)

12 *A* is the point with coordinates (4, 11)
  B is the point with coordinates (8, 3)

Work out the coordinates of the midpoint of *AB*.

(......................... , ...)

(Total for Question 12 is 2 marks)

13 A plane flew 8740 km from Nairobi to Hong Kong.
  The flight time was 13 hours 15 minutes.

Work out the average speed of the plane.
Give your answer, in kilometres per hour, correct to the nearest whole number.

.... kilometres per hour

(Total for Question 13 is 3 marks)

14 There are 80 counters in a bag.
The counters are either red or blue.

The ratio of the number of red counters to the number of blue counters is $3:1$

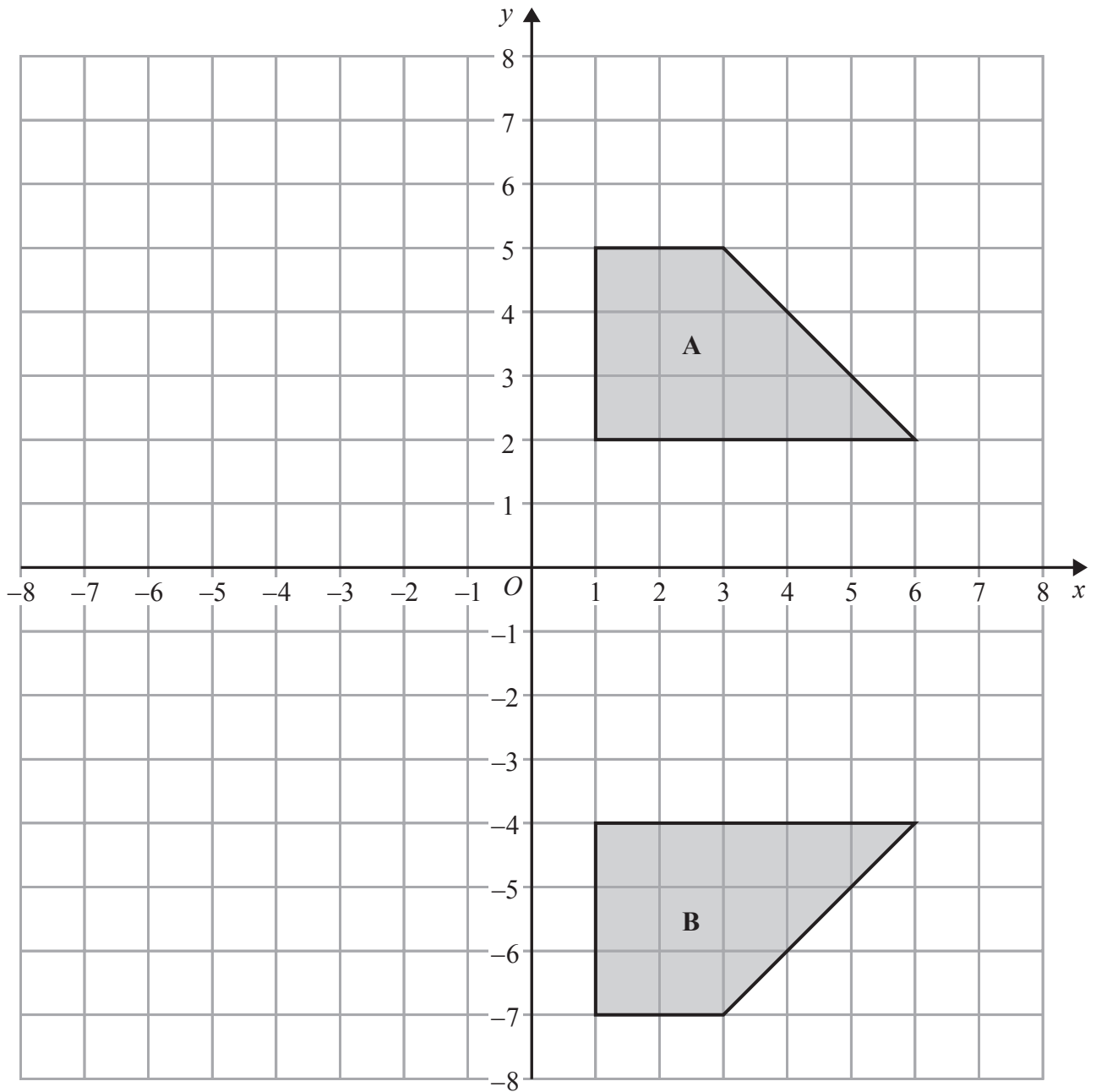Michael takes 15% of the red counters out of the bag.

Alison takes $\dfrac{1}{5}$ of the blue counters out of the bag.

How many counters are now in the bag?

....

(Total for Question 14 is 5 marks)

15

(a) Describe fully the single transformation that maps shape **A** onto shape **B**.

....

....

(2)

(b) On the grid, rotate shape **A** 90° anticlockwise about (0, 0)
Label the new shape **C**.
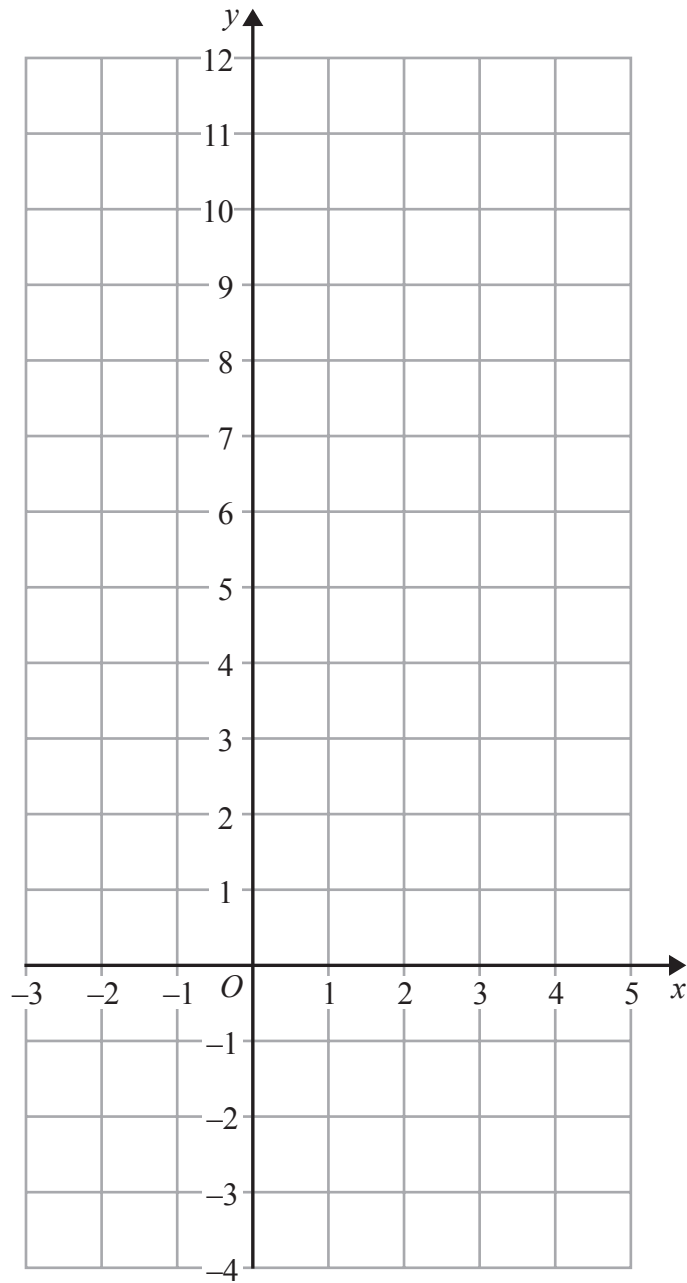
(2)

(Total for Question 15 is 4 marks)

16 On the grid, draw the graph of $y + 2x = 6$ for values of x from -2 to 4

(Total for Question 16 is 4 marks)

Turn over ▶

17 A lion is 224 cm long.

Simon makes a scale model of the lion.
He uses a scale of 1 : 8

(a) Work out the length of the scale model.

.... cm

(2)

In 2010, there were 411 Asiatic lions in India.
In 2015, there were 523 Asiatic lions in India.

(b) Work out the percentage increase in the number of Asiatic lions in India from
2010 to 2015
Give your answer correct to 1 decimal place.

....%

(3)

(Total for Question 17 is 5 marks)

18 The table gives information about the weights of 20 rugby players.

Weight (w kg)	Frequency
$80 < w \leqslant 90$	3
$90 < w \leqslant 100$	5
$100 < w \leqslant 110$	7
$110 < w \leqslant 120$	4
$120 < w \leqslant 130$	1

(a) Write down the modal class.

....

(1)

(b) Work out an estimate for the total weight of these 20 rugby players.

.... kg

(3)

(Total for Question 18 is 4 marks)

P 4 8 4 0 3 A 0 1 9 2 4

19 Here is an isosceles triangle.

Diagram **NOT** accurately drawn

18 cm   18 cm

14 cm
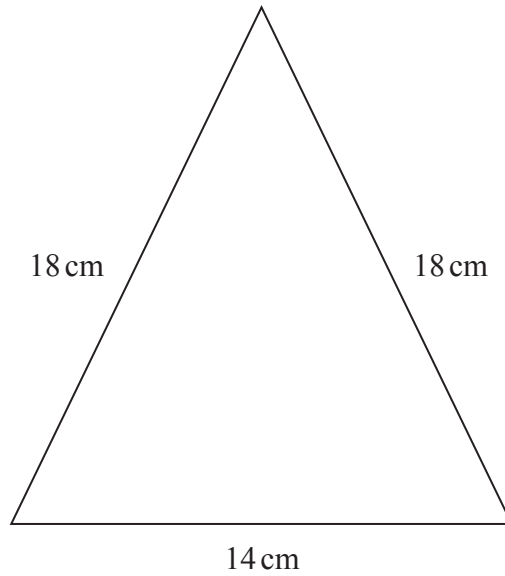
Work out the area of the triangle.
Give your answer correct to 3 significant figures.

.... cm^2

(Total for Question 19 is 4 marks)

20 (a) Solve

$$7x + 2y = 16$$
$$5x - 2y = 20$$

Show clear algebraic working.

$x = $ ....

$y = $ ....

(3)

(b) Expand and simplify $(k + 9)(k - 5)$

....

(2)

(Total for Question 20 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

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