

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										



General Certificate of Secondary Education
Foundation Tier
November 2010

Mathematics (Specification A)

4306/2F

F

Paper 2 Calculator

Friday 12 November 2010 9.00 am to 10.30 am

<p>For this paper you must have:</p> <ul style="list-style-type: none"> • a calculator • mathematical instruments. 	
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Time allowed

- 1 hour 30 minutes

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- 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.
- If your calculator does not have a π button, take the value of π to be 3.14 unless otherwise instructed in the question.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 100.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.
- You are expected to use a calculator where appropriate.

Advice

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

For Examiner's Use	
Examiner's Initials	
Pages	Mark
3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
26–27	
TOTAL	



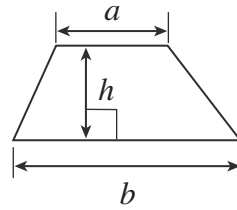
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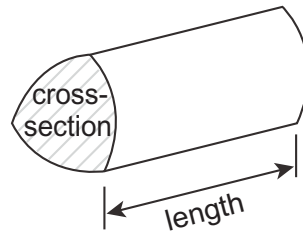
4306/2F

Formulae Sheet: Foundation Tier

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



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



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

- 1 (a)** In a shop 100 g of cheese cost 56 p.
Joe buys 250 g of the cheese.

How much does he pay?

.....
.....

Answer £ (2 marks)

- 1 (b)** A packet of biscuits costs 27p.
How many packets can Joe buy for £1?

.....
.....

Answer (1 mark)

- 2 (a)** Write the number, seventy five thousand and forty, in figures.

Answer (1 mark)

- 2 (b)** Write the number 9008 in words.

Answer (1 mark)

Turn over for the next question



3 Here are five number cards.

2

10

12

20

25

3 (a) Choose one of the cards to give the percentage that is equivalent to $\frac{1}{4}$

Answer

%

(1 mark)

3 (b) Choose two of the cards to make a fraction that is equivalent to $\frac{1}{5}$

Answer

<input type="text"/>
—
<input type="text"/>

(1 mark)

3 (c) Choose two of the cards to make a fraction that is equivalent to 50%.

Answer

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—
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(1 mark)



- 4** People who have been married for a certain number of years have special anniversaries.

Number of years	Name of Anniversary
25	Silver
30	Pearl
40	Ruby
50	Golden
60	Diamond

- 4 (a)** John and Jane were married in 1972.

In what year was their silver anniversary?

.....

Answer (1 mark)

- 4 (b)** Abdul and Jasmin had their golden anniversary in 2004.

In what year were they married?

.....

Answer (1 mark)

- 4 (c)** Zeke and Ruth had their ruby anniversary in 1989.

In what year was their diamond anniversary?

.....

Answer (2 marks)

Turn over for the next question



- 5** The number of hours of sleep needed by a child is given by the formula

$$\text{Number of hours needed} = \frac{30 - \text{age of child in years}}{2}$$

- 5 (a)** Use the formula to work out the number of hours needed for

- 5 (a) (i)** Suki, who is six years old

.....

Answerhours (2 marks)

- 5 (a) (ii)** George, who is a new born baby.

.....

Answerhours (1 mark)

- 5 (b)** Mark needs 13 hours sleep.

Use the formula to work out Mark's age.

.....

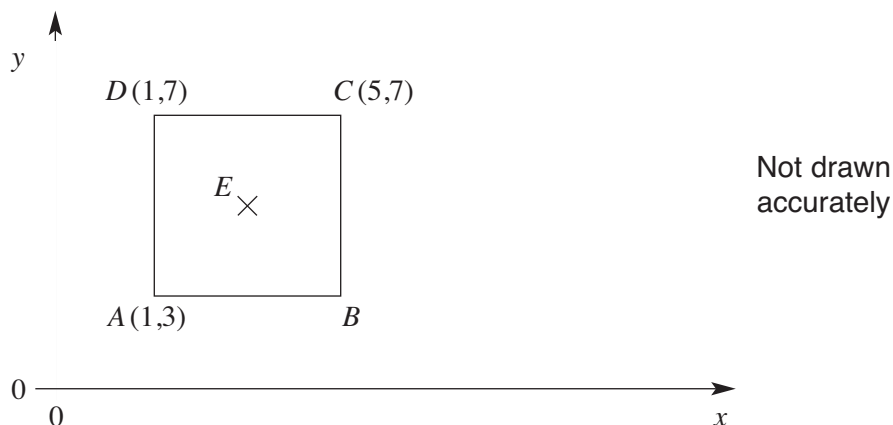
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.....

Answer years old (2 marks)



- 6** $ABCD$ is a square.
 AB is parallel to the x axis.



- 6 (a)** Work out the coordinates of B .

.....

Answer (..... ,) (1 mark)

- 6 (b)** Work out the length of AD .

.....

Answerunits (1 mark)

- 6 (c)** Work out the area of the square.

.....

Answersquare units (1 mark)

- 6 (d)** The centre of the square is E .

Work out the coordinates of E .

.....

Answer (..... ,) (1 mark)



7

Ruth has four number cards.

4

8

10

12

She chooses a card at random.

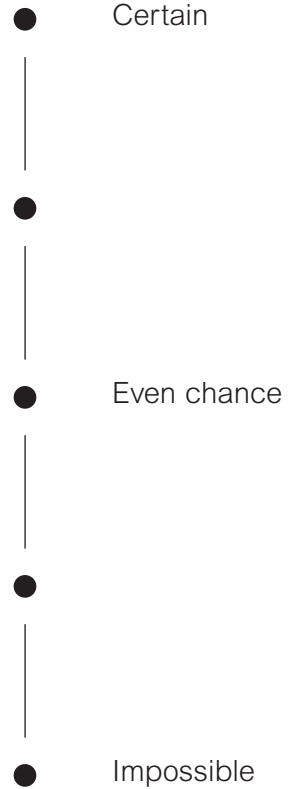
Draw lines connecting the probability of each statement to the correct position on the probability scale.

It is an even number

It is the number 3

It is a number less than 9

It is the number 10



(3 marks)



- 8** A bag contains a red ball (R), a blue ball (B) and a green ball (G).
A coin can land on heads (H) or tails (T).
A ball is chosen at random from the bag and the coin is thrown.
One of the possible outcomes is a red ball and a head (RH).

List all the other possible outcomes.

Answer RH,

.....

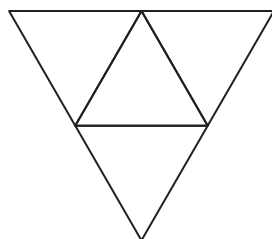
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(2 marks)

- 9 (a)** Draw a sketch of a cube.

(1 mark)

- 9 (b)** The net of a 3-D shape is drawn below.



Circle the name of the solid formed by the net.

Triangular prism

Tetrahedron

Equilateral triangle

(1 mark)

7

Turn over ►



10 (a) Work out $(3 + 4) \times 5$

.....

Answer (1 mark)

10 (b) Insert **one** pair of brackets to make the following calculation correct.

.....

$$6 \times 9 - 7 + 3 = 15$$

(1 mark)

10 (c) Insert **two** pairs of brackets to make the following calculation correct.

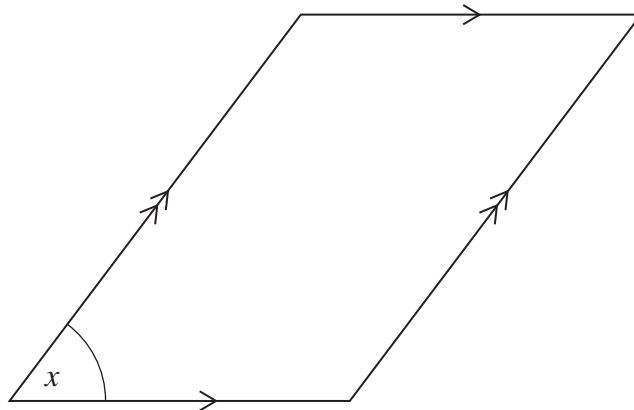
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$$3 + 2 \times 5 + 6 = 55$$

(1 mark)



- 11** A quadrilateral is drawn accurately below.
It has two pairs of parallel sides.



- 11 (a)** How many lines of symmetry does this quadrilateral have?

Answer (1 mark)

- 11 (b)** Write down the mathematical name for the quadrilateral.

Answer (1 mark)

- 11 (c)** Mark an obtuse angle on the diagram.
Label it y .

(1 mark)

- 11 (d)** Measure the length of one of the longer sides of the quadrilateral.

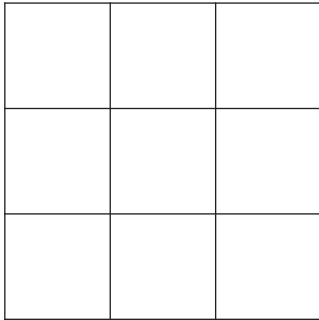
Answercm (1 mark)

- 11 (e)** Measure the size of angle x .

Answerdegrees (1 mark)

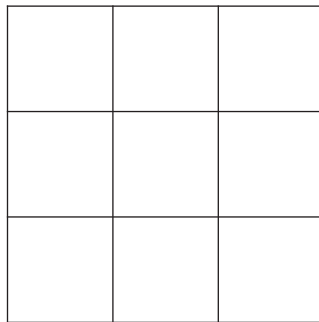


- 12 (a)** On the grid below shade four squares so that the shaded shape has rotational symmetry of order four.



(1 mark)

- 12 (b)** On the grid below shade two squares so that the shaded shape has one line of symmetry



(1 mark)

- 12 (c)** Edith says that an isosceles triangle has rotational symmetry of order three.

Why is Edith wrong?

.....

.....

(1 mark)



13 When teams play football the goal difference is the subtraction

total number of goals scored in all matches – total number of goals conceded in all matches

13 (a) After ten matches the results for four teams are shown below.

For example, after ten matches Team A has scored 17 goals and conceded 33
Their goal difference is $17 - 33 = -16$

Complete the table.

Team	Number of goals scored	Number of goals conceded	Goal difference
A	17	33	– 16
B	25	21	4
C	11	20	
D	15		– 11

(2 marks)

13 (b) In the next match Team A plays, they score 3 goals and concede 1 goal.

What is the new goal difference for Team A?

.....

Answer (1 mark)

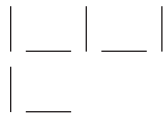
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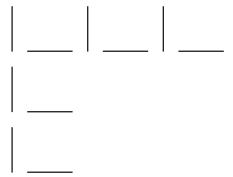
14 These patterns are made from sticks.



Pattern 1



Pattern 2



Pattern 3

14 (a) Draw Pattern 4.

(1 mark)

14 (b) Complete the table.

Pattern Number	1	2	3	4	5
Number of sticks	3	7	11		

(2 marks)

14 (c) Write down a rule for continuing the patterns.

.....

.....

(1 mark)

14 (d) Explain why you **cannot** make one of these patterns with exactly 32 sticks.

.....

.....

(1 mark)



- 15** Jane needs 250 kg of wood chip for her garden.
At the garden centre she can buy it in two ways, in bags or a single load that is delivered.

One bag weighs 25 kg and costs £2.85

She takes the bags home in her van

A single load weighs 250 kg and costs £17

The delivery charge is £10

Which is the cheaper way of buying the 250 kg of wood chip?

Show all your working.

.....

.....

.....

.....

.....

.....

Answer (4 marks)

- 16 (a)** Simplify $7a + 8a - 6a$

.....

Answer (1 mark)

- 16 (b)** Insert the symbols $+$ or $-$ so that the statement is correct.

$$7a \dots 8f \dots 6a \dots 5f = 13a - 3f \quad (2 \text{ marks})$$

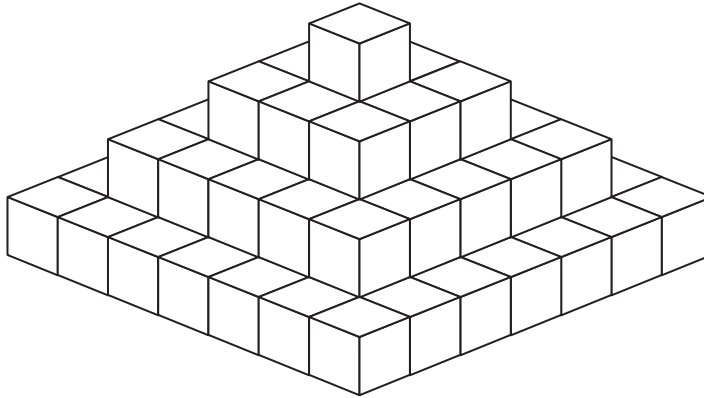


- 17 (a) The first six square numbers are 1, 4, 9, 16, 25 and 36.

Write down the next **three** square numbers

Answer (2 marks)

- 17 (b) This 3-dimensional shape is made using four layers of centimetre cubes.



Not drawn
accurately

The plan view of each layer is a square.

What is the volume of the 3-dimensional shape?

.....

.....

.....

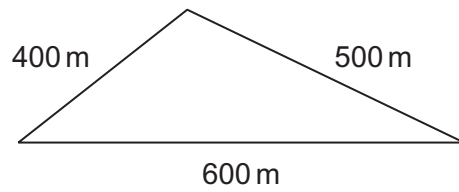
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Answercm³ (3 marks)



18

A plot of land is in the shape of a triangle with sides 400 m, 500 m and 600 m.
The sketch shows the plot of land.



Not drawn
accurately

Draw the triangle accurately, using a scale of 1 cm to 50 m.

(3 marks)

Turn over for the next question



- 19** The table shows the marks scored on a mental arithmetic test by 30 students.

Mark	Frequency
4	3
5	1
6	2
7	8
8	6
9	5
10	5

- 19 (a)** Which mark is the mode?

.....

Answer (1 mark)

- 19 (b)** Which mark is the median?

.....

Answer (1 mark)

- 19 (c)** What is the range of the data?

.....

Answer (1 mark)

- 19 (d)** Calculate the mean mark.

.....

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.....

.....

.....

Answer (3 marks)



20 Use your calculator to evaluate $\frac{0.3}{0.7^2}$

20 (a) Write down your full calculator display.

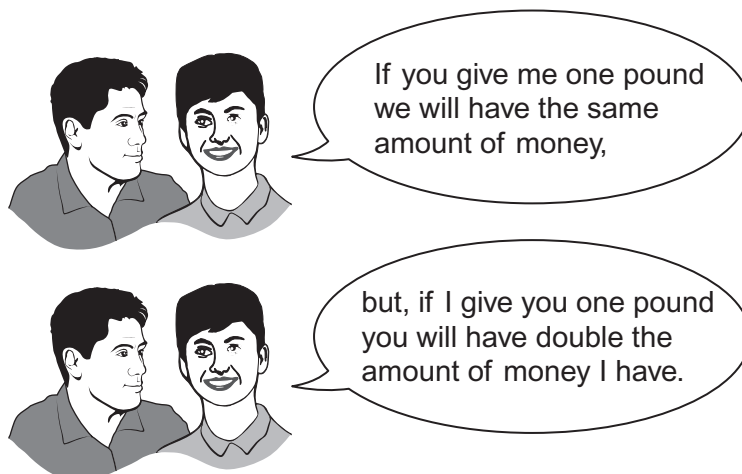
Answer (1 mark)

20 (b) Give your answer to one significant figure.

Answer (1 mark)

21 Sal and Bill each have a whole number of pounds

Sal says to Bill



How much do Sal and Bill have?
Show your working.

.....

.....

.....

.....

Answer Sal £ Bill £ (3 marks)



22 A rectangle is 5.6 cm long and 3.7 cm wide.

22 (a) Calculate the area of the rectangle.

.....
.....

Answercm² (2 marks)

22 (b) Calculate the perimeter of the rectangle.

.....
.....

Answercm (1 mark)

23 Increase £145 by 18%.

.....
.....
.....
.....

Answer £ (3 marks)



24 (a) p is a prime number and r is an odd number.

Is the expression pr^2 always odd, always even or could it be either odd or even?

Tick the correct box.

☐

Always odd

☐

Always even

☐

Could be either odd or even

Give examples to justify your answer.

.....

.....

(1 mark)

24 (b) x , y and z are all odd numbers.

Write an expression in terms of x , y and z so that the value of the expression is always even.

.....

Answer

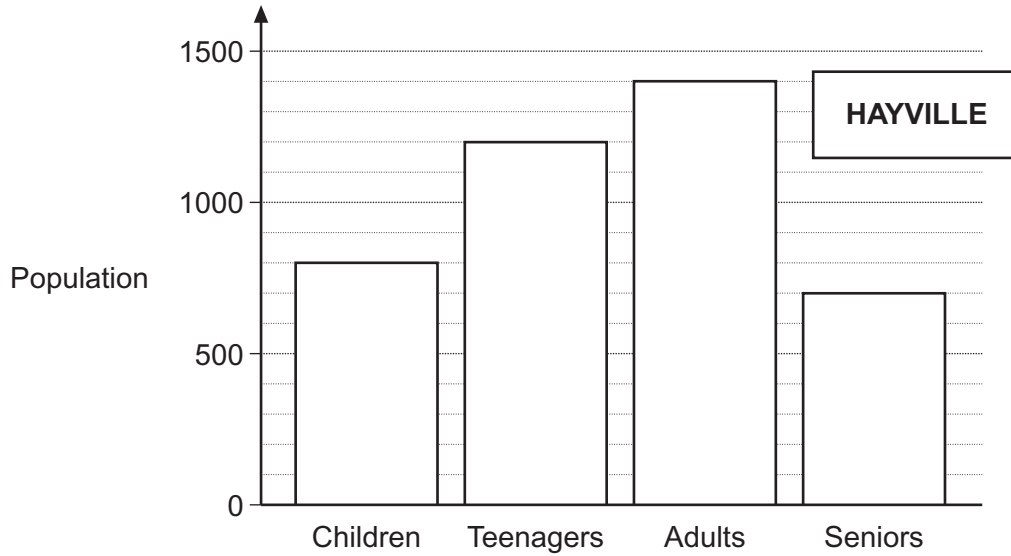
(1 mark)

Turn over for the next question

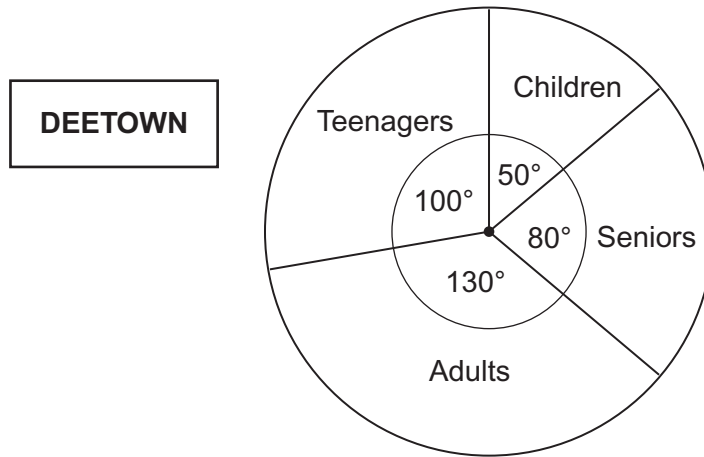


25

The bar chart shows a breakdown of the population of Hayville.



The pie chart shows the proportions of the same groups in Deetown



There are twice as many people in Deetown as Hayville.

Work out the number of people in Deetown who are Adults.

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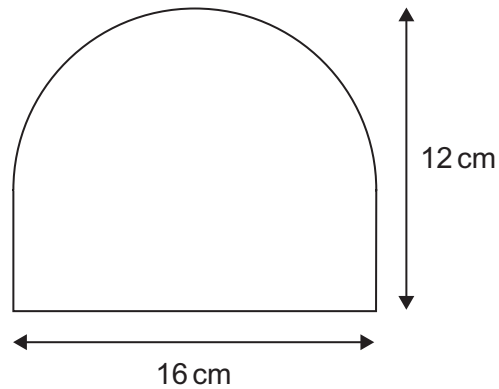
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Answer (4 marks)



26

This shape is made from a rectangle and a semicircle.

Not drawn
accurately

Calculate the area of the shape.

.....

.....

.....

.....

.....

.....

Answercm² (4 marks)

27

Share £250 in the ratio 5 : 3

.....

.....

.....

.....

Answer £ and £ (2 marks)



28

The waist-to-hip ratio has been found to be an important predictor of health problems.

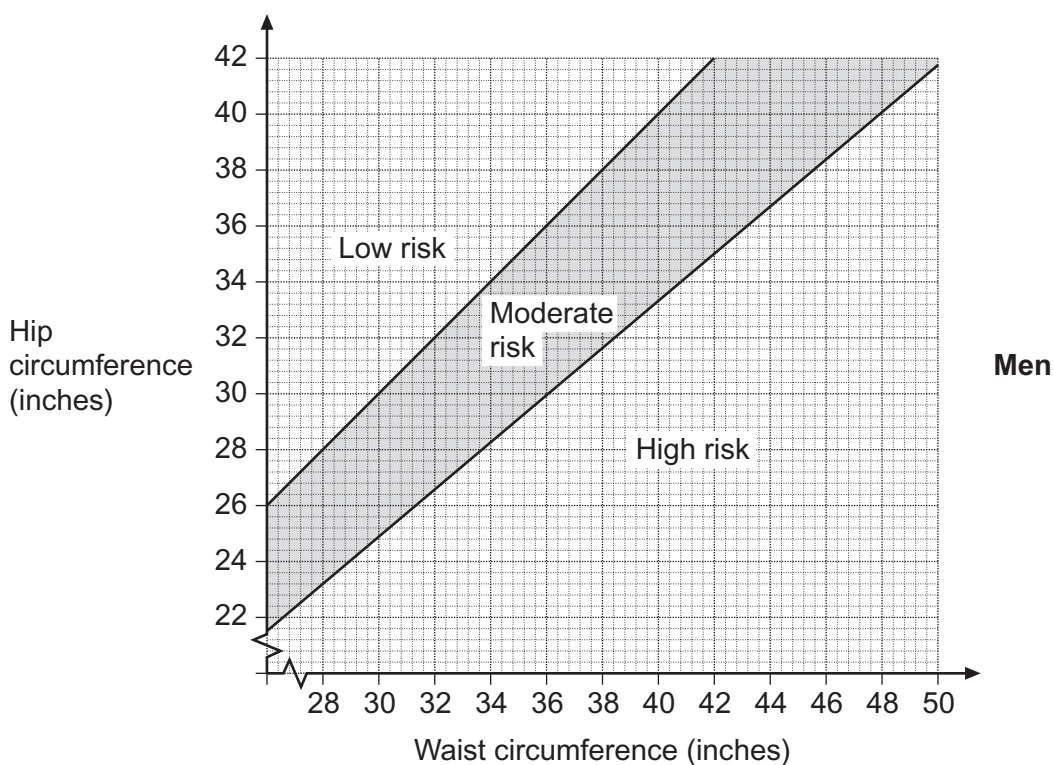
The ratio is expressed as $1 : n$

where
$$n = \frac{\text{waist circumference}}{\text{hip circumference}}$$

The table shows the health risk associated with different ratios.

Risk	Men	Women
High Risk	$n > 1.2$	$n > 1$
Moderate Risk	$1 \leq n \leq 1.2$	$0.8 \leq n \leq 1$
Low Risk	$n < 1$	$n < 0.8$

This graph shows the health risk for **men** for various waist and hip circumferences



28 (a) Alf has a waist circumference of 38 inches and a hip circumference of 30 inches.

Is Alf at high, moderate or low health risk?

.....

Answer (1 mark)

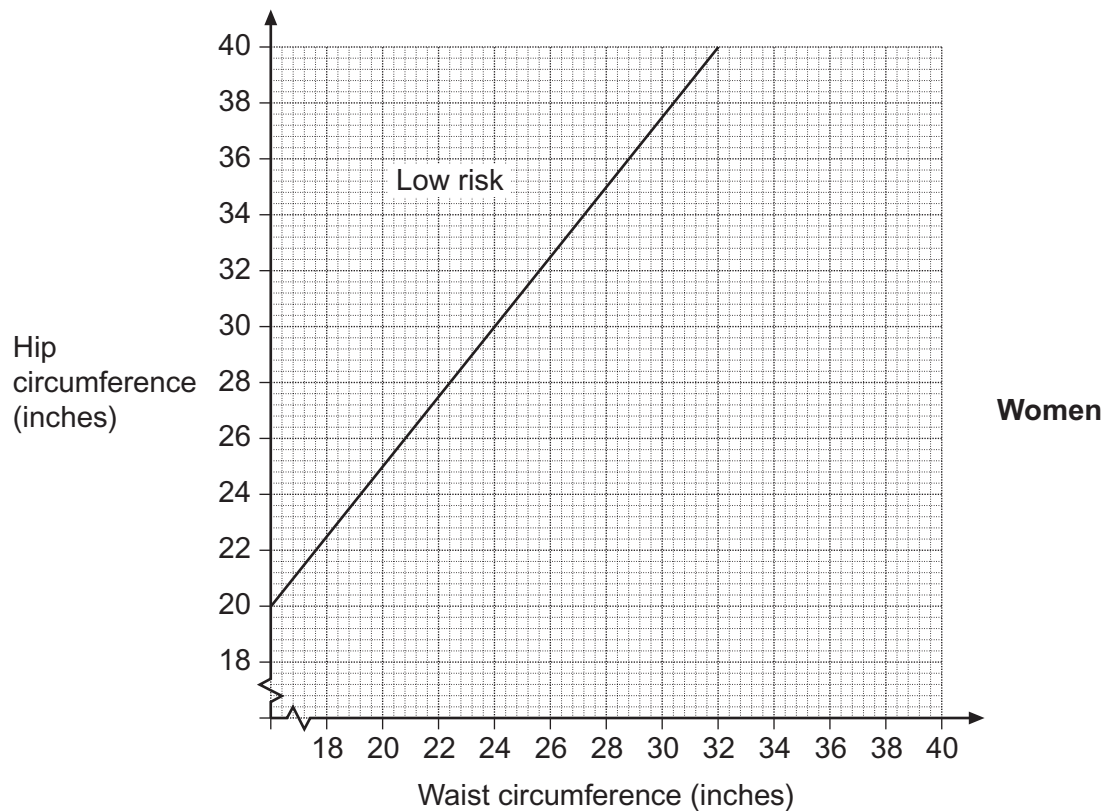


- 28 (b)** Marlene has a 24 inch waist circumference.
What would her hip circumference be if $n = 0.8$?

.....

Answerinches (1 mark)

- 28 (c)** On the graph below the boundary line between low and moderate health risk is shown for women,



Complete the graph to show the health risk factors for **women**.

.....

.....

.....

(2 marks)



- 29 Solve the inequality $2x - 1 < 7$

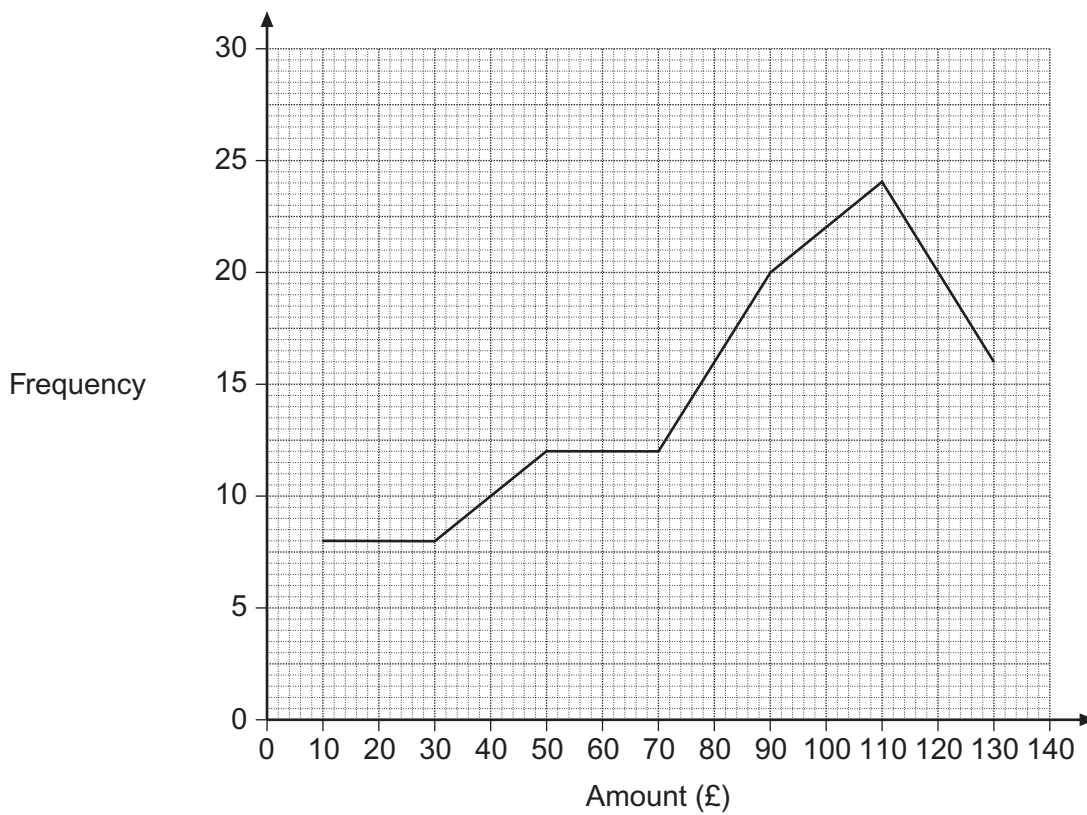
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Answer (2 marks)

- 30 The frequency polygon shows the amount of money that 100 shoppers spend at shop A.



The amount of money that another 100 shoppers spend at shop B is shown below.

Amount, x (£)	Frequency
$0 < x \leq 20$	6
$20 < x \leq 40$	8
$40 < x \leq 60$	18
$60 < x \leq 80$	28
$80 < x \leq 100$	20
$100 < x \leq 120$	10
$120 < x \leq 140$	10

30 (a) On the same grid draw a frequency polygon to show this information.

(2 marks)

30 (b) Make one comparison about the amount of money spent at the two shops as shown by the two frequency polygons.

.....

.....

(1 mark)

END OF QUESTIONS



There are no questions printed on this page

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