Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
November 2023

Mathematics

StemUp Model Solution

Unit M6 Paper 2
(With calculator)
Foundation Tier



[GMC62]

GMC62

THURSDAY 23 NOVEMBER, 10.45 am – 11.45 am

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page, on blank pages or tracing paper.
Complete in black ink only. **Do not write with a gel pen.**
Answer **all seventeen** questions.
All working should be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.
You **may** use a calculator for this paper.

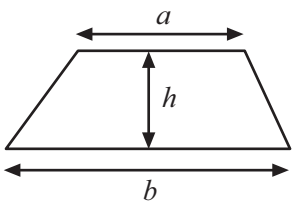
INFORMATION FOR CANDIDATES

The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a calculator, ruler, compasses and a protractor.
The Formula Sheet is on page 2.

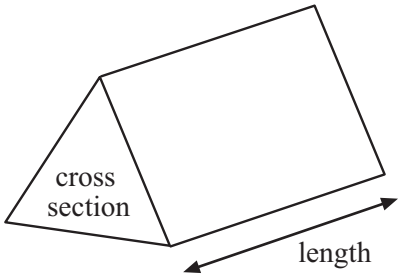
14120

Formula Sheet

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



Volume of prism = area of cross section × length



14120

1 Two companies offer Jack a job as a car mechanic.

The Car Guys will pay Jack £112.70 per day, working Monday to Friday.

Dr Auto will pay Jack £15.49 an hour for a 37-hour week.

Which company pays the higher weekly wage, and by how much?

Show your working.

The Car Guys: 112.70 × 5 = £563.50

Dr Auto: 15.49 × 37 = £573.13

573.13 − 563.50 = £9.63

Answer Dr Auto pays £ 9.63 more each week [3]

[Turn over

2 **(a)** Tom, a quarterback, weighs 16 stone 5 pounds.

1 stone = 14 pounds

What is Tom's weight in pounds?



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16 × 14 + 5 = 224 + 5 = 229

Answer 229 pounds [1]

(b) Andy, a rugby player, weighs 120 kg.

Who is heavier, Tom or Andy?

Show all working clearly.



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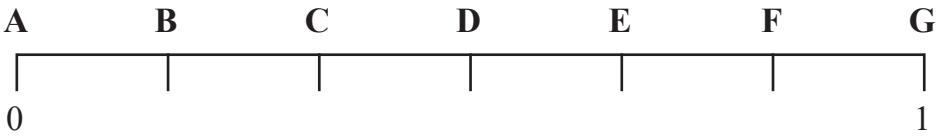
Andy: 120 × 2.2 = 264 pounds

Tom: 229 pounds

264 > 229

Answer Andy is heavier [2]

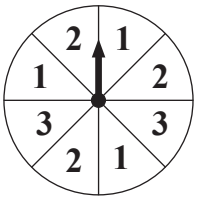
3



The probability scale shown has been labelled with letters **A** to **G**.

Write down **the letter** which matches the probability of the following events happening.

(a) This spinner is spun once.



It lands on a number less than 4

1, 2 and 3 are all less than 4, so certain

Answer *G* [1]

(b) A fair dice is thrown.



© Getty Images

It lands on an even number.

3 even out of 6 = 3/6 = 1/2

Answer *D* [1]

(c) There are 12 beads in a bag.



Five beads are blue, three beads are pink, and the rest are yellow.

A bead is taken out of the bag at random.

The bead taken is yellow.

12 − 5 − 3 = 4 yellow, 4/12 = 1/3

Answer *C* [1]

[Turn over

4

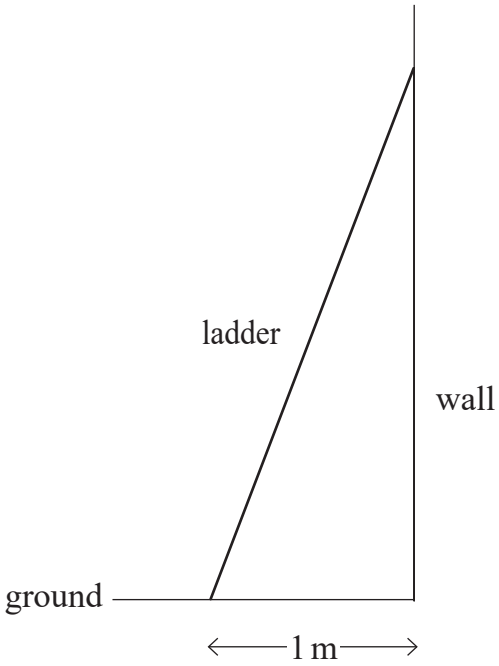


diagram not drawn accurately

A ladder is 4 metres long.

The bottom of the ladder is 1 metre from a vertical wall.

stemup.co.uk

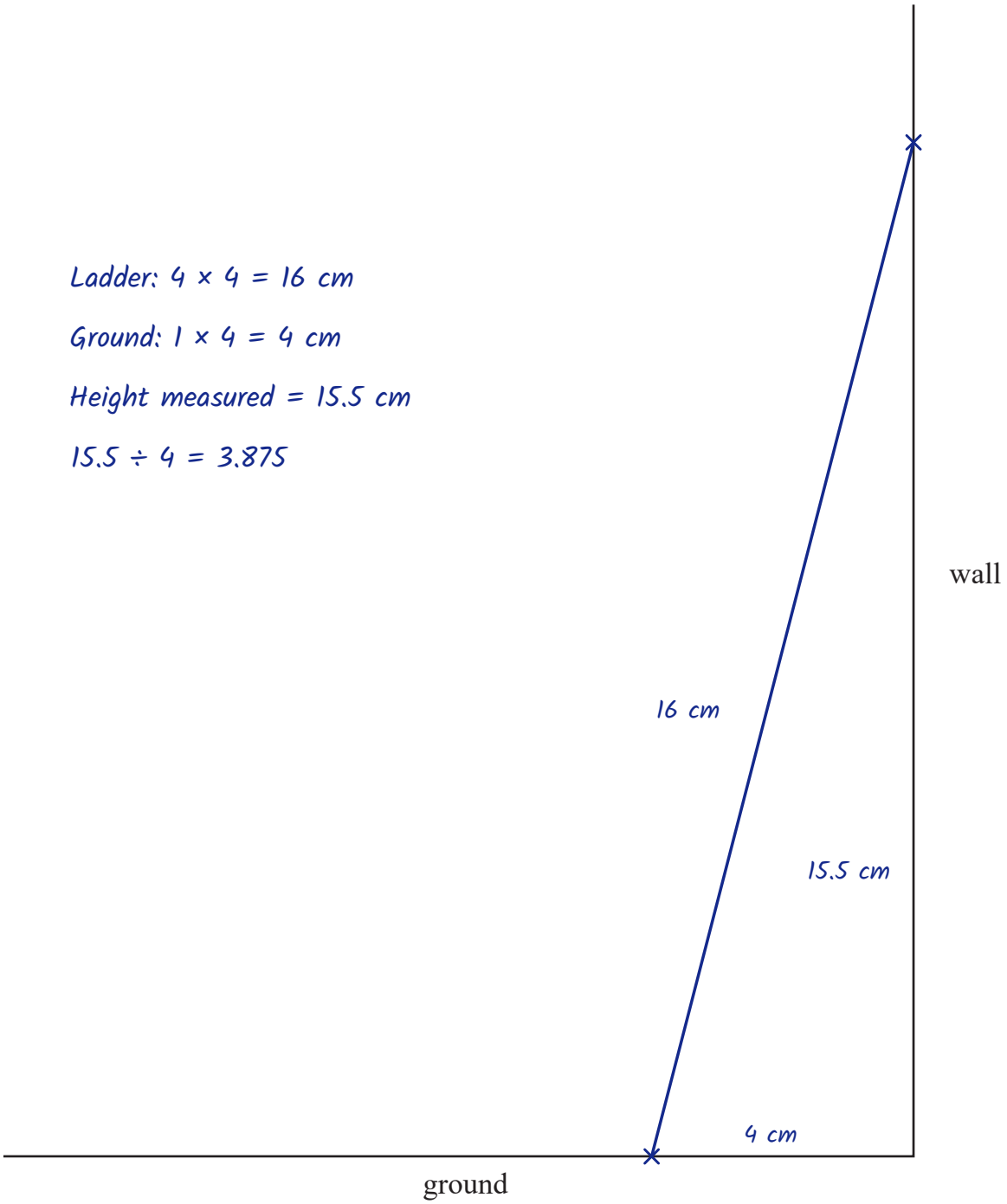
Use a scale drawing, with 4 cm : 1 m, to find the height of the top of the ladder above the ground.

Ladder: 4 × 4 = 16 cm

Ground: 1 × 4 = 4 cm

Height measured = 15.5 cm

15.5 ÷ 4 = 3.875



Answer 3.9 m [3]

[Turn over

5



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It takes 2 days to paint the outside of 6 houses.

(a) How long would it take to paint the outside of 15 houses?

15 ÷ 6 = 2.5, 2.5 × 2 = 5

Answer 5 days [2]

(b) State one assumption you made in answering part **(a)**.

Answer All the houses are the same size

and the painters work at the same rate [1]

6 Here are some numbers.

12	8	29
18	30	46
49	2	21

From the numbers given, write down

(a) the square number,

Answer 49 [1]

(b) the cube number,

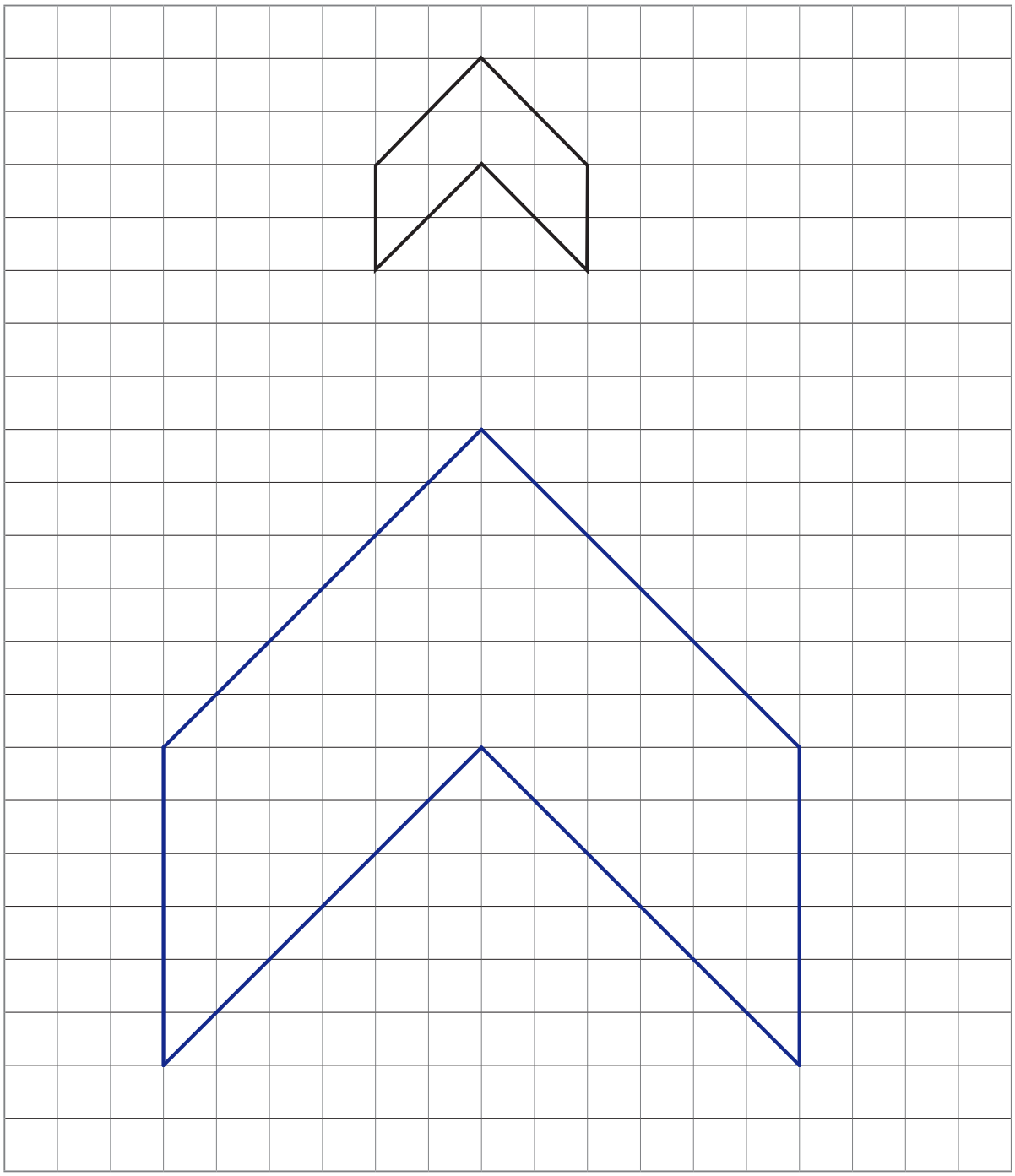
Answer 8 [1]

(c) the triangular number.

Answer 21 [1]

[Turn over

7 Enlarge the shape on the grid below using a **scale factor of 3**



[3]

8 Conor mixes red, blue and yellow paint in the ratio 4 : 2 : 1

He uses 10 litres of blue paint.

He sells the mixed paint at a price of £18.25 per litre.

Work out the total price of the mixed paint.

Blue = 2 parts = 10 litres

1 part = 10 ÷ 2 = 5 litres

Total = 4 + 2 + 1 = 7 parts

7 × 5 = 35 litres

35 × 18.25 = 638.75

Answer £ 638.75 [3]

[Turn over

9



© Getty Images

A firm holds a Christmas raffle for its 20 employees.

The raffle tickets are numbered from 1 to 20

A ticket is drawn at random from a hat.

What is the probability that the ticket drawn is

(a) a number less than 10,

1, 2, ..., 9: 9 numbers

Answer 9/20 [1]

(b) a number more than 14,

15, 16, 17, 18, 19, 20: 6 numbers

Answer 6/20 [1]

(c) a prime number?

2, 3, 5, 7, 11, 13, 17, 19: 8 numbers

Answer 8/20 [1]

10 Julie collects 50 p coins.

70 of these coins weigh 560 g.

What is the **value** of 880 g of these coins?

560 ÷ 70 = 8 g per coin

880 ÷ 8 = 110 coins

110 × 0.50 = £55

Answer £ 55 [3]

[Turn over

11 Ben and Orla share the cost of a meal in the ratio 3 : 1

The meal costs £64

Ben then pays the taxi fare.

Ben pays a total of £60

How much is the taxi fare?

3 + 1 = 4 parts

64 ÷ 4 = 16

Ben's share = 16 × 3 = £48

Taxi = 60 − 48 = £12

Answer £ 12 [3]

12 Data is recorded about the age and treatment received by patients who visit a dentist on a Monday.

	Patients aged 30 or under	**Patients aged over 30**
Filling	9	6
Extraction	5	13

(a) What is the probability that one of these patients selected at random is over 30 and has an extraction?

Total = 9 + 6 + 5 + 13 = 33

Answer 13/33 [1]

(b) One of the patients aged 30 or under is selected at random.

What is the probability that this patient has a filling?

Aged 30 or under = 9 + 5 = 14

Answer 9/14 [1]

[Turn over

13 A sketch of an irregular pentagon is shown.

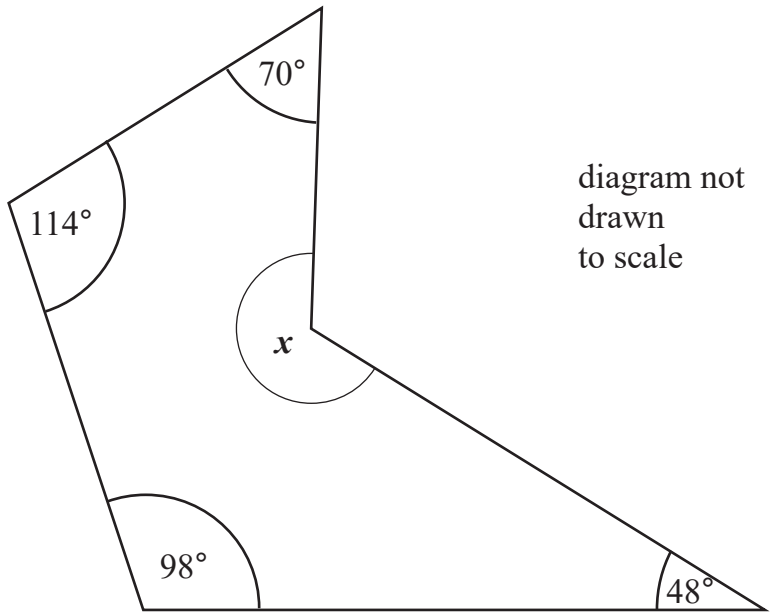


diagram not drawn to scale

Calculate the value of x.

Show all your working.

Angles in a pentagon = 3 × 180 = 540°

114 + 98 + 48 + 70 = 330°

x = 540 − 330 = 210°

Answer 210 ° [3]

14 Simplify $(x^5)^3$

5 × 3 = 15

Answer x^{15} [1]

15 Use trial and improvement to find a solution of the equation

$$x^2 + \frac{x}{2} = 15$$

Give your answer correct to 1 decimal place.

You must show all your working.

x	$x^2 + x/2$	result
3	10.5	too small
4	18	too big
3.6	14.76	too small
3.7	15.54	too big
3.65	15.1475	too big

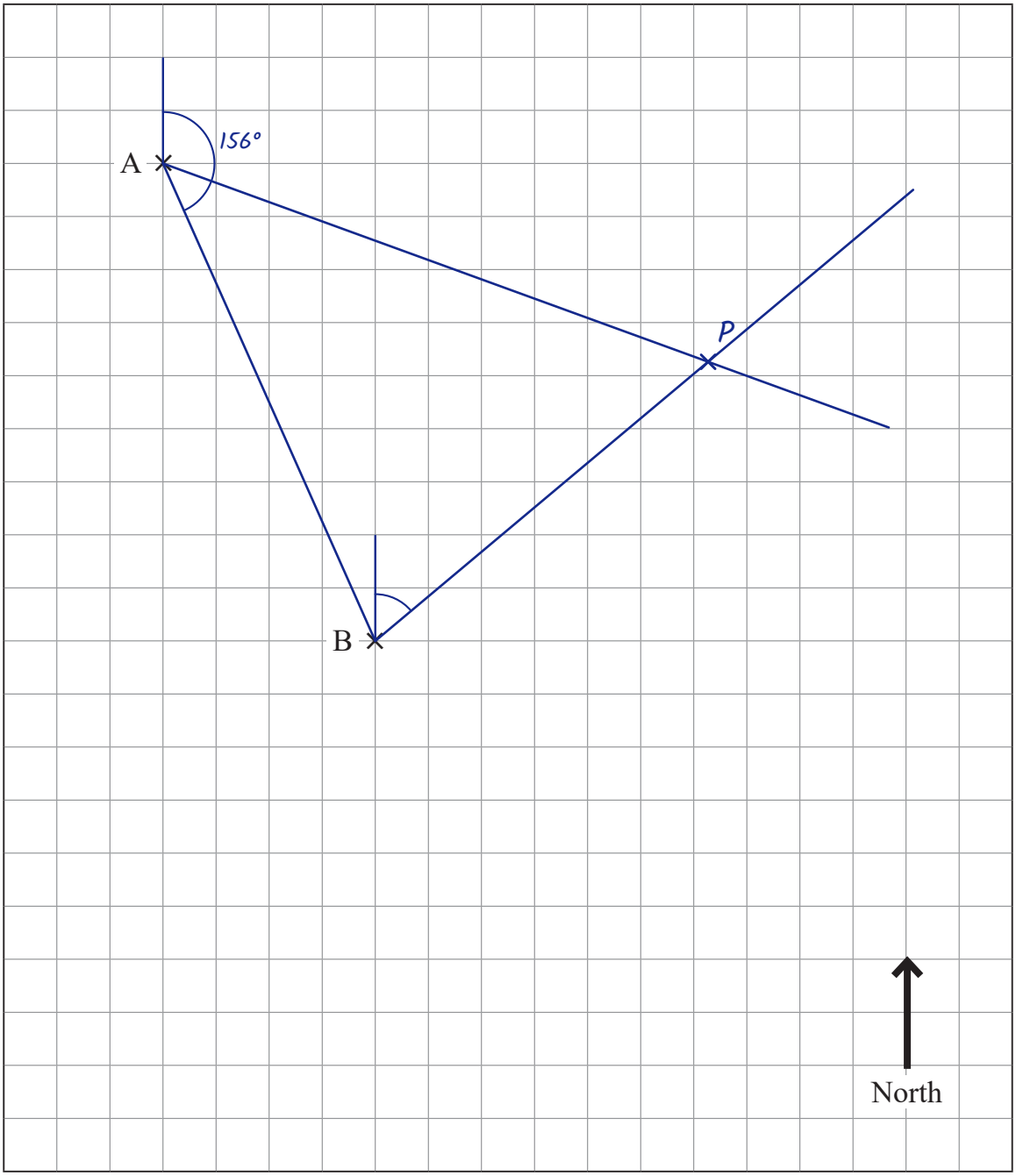
Answer $x =$ 3.6 [4]

[Turn over

16 The position of two Airport Control Towers, A and B, are shown.

(a) What is the bearing of B **from A**?

Answer 156 ° [1]



(b) The two towers pick up a distress signal from a plane.

The bearing of the plane from A is 110°

The bearing of the plane from B is 050°

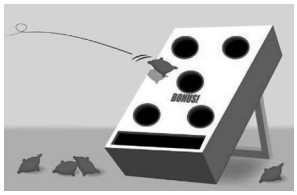
Find and mark the position of the plane with a P on the diagram. [2]

Bearing 110° drawn from A and 050° from B

P is where the lines cross (on the diagram)

[Turn over

17 Kate plays the game "throw the bean bag".



She records the number of times she gets the bean bag in the bonus hole.

Total number of throws	10	30	100	200
Total number of times in the bonus hole	2	8	49	104

(a) Write down the best estimate of the probability that Kate gets the bean bag in the bonus hole if she continues throwing.

Give a reason for your answer.

Answer *104/200 = 0.52*

because *it uses the most throws, and the more*

throws the better the probability estimate [2]

(b) Kate continues with her game and throws it a total of 300 times.

Calculate the number of times you would expect her to get the bean bag in the bonus hole.

104/200 × 300 = 0.52 × 300 = 156

Answer *156* [2]

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