

Pre Paper 3F Practice Paper
June 2018
GCSE Mathematics (AQA style)

Foundation Tier

Name

Class

INSTRUCTIONS TO CANDIDATES

- Read each question carefully. Make sure you know what you have to do before starting your answer.
- You are permitted to use a calculator in this paper.
- You may use the π button on your calculator or you may take the value of π to be 3.142.
- Do all rough work in this book.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets at the end of each question or part question on the Question Paper.
- You are reminded of the need for clear presentation in your answers.
- The questions included in this practice paper have been selected from parts of the specification not tested in Paper 1F or Paper 2F. You should not assume, however, that because a topic appeared on Paper 1F or Paper 2F, it will not appear on Paper 3F, nor can the topics here be regarded as an exhaustive list of those to be examined on Paper 3F.

Included with each question is the statement from the specification to which it applies (where "basic foundation content" is in normal type, and "additional foundation content" is in underlined type); content in *italics* is taken from the 'notes' sections of the specification. The "basic foundation content" and "additional foundation content" can be assessed on Foundation tier question papers..

© The PiXL Club Limited 2018

This resource is strictly for the use of member schools for as long as they remain members of The PiXL Club. It may not be copied, sold nor transferred to a third party or used by the school after membership ceases. Until such time it may be freely used within the member school. All opinions and contributions are those of the authors. The contents of this resource are not connected with nor endorsed by any other company, organisation or institution.

Question	Mark	out of
1		1
2		1
3		1
4		1
5		5
6		5
7		3
8		5
9		3
10		6
11		1
12		1
13		4
14		2
15		3
16		3
17		5
18		5
19		4
20		3
21		2
22		3
23		4
24		5
25		2
26		2
Total		80

Answer **all** questions in the spaces provided

- 1** **N15** round numbers and measures to an appropriate degree of accuracy (eg to a specified number of decimal places or significant figures)

What is 4.8951 rounded to 3 significant figures?

Circle your answer.

[1 mark]

4.895

4.89

4.9

4.90

- 2** **R9** interpret percentages and percentage changes as a fraction or a decimal, and interpret these multiplicatively

Which of these calculations increases 48 by 8% ?

Circle your answer.

[1 mark]

48×8

48×1.8

48×0.08

48×1.08

- 3** **S4** *students should know and understand the terms: primary data, secondary data, discrete data and continuous data*

Guy wants to write a report about the kinds of employment held by people in the town where he lives.

He decides to compile a questionnaire and conduct a survey.

Which word describes the data he will collect?

Circle your answer.

[1 mark]

continuous

discrete

primary

secondary

4 **G12** identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres

A pyramid has 10 edges.

How many faces does it have?

Circle your answer.

[1 mark]

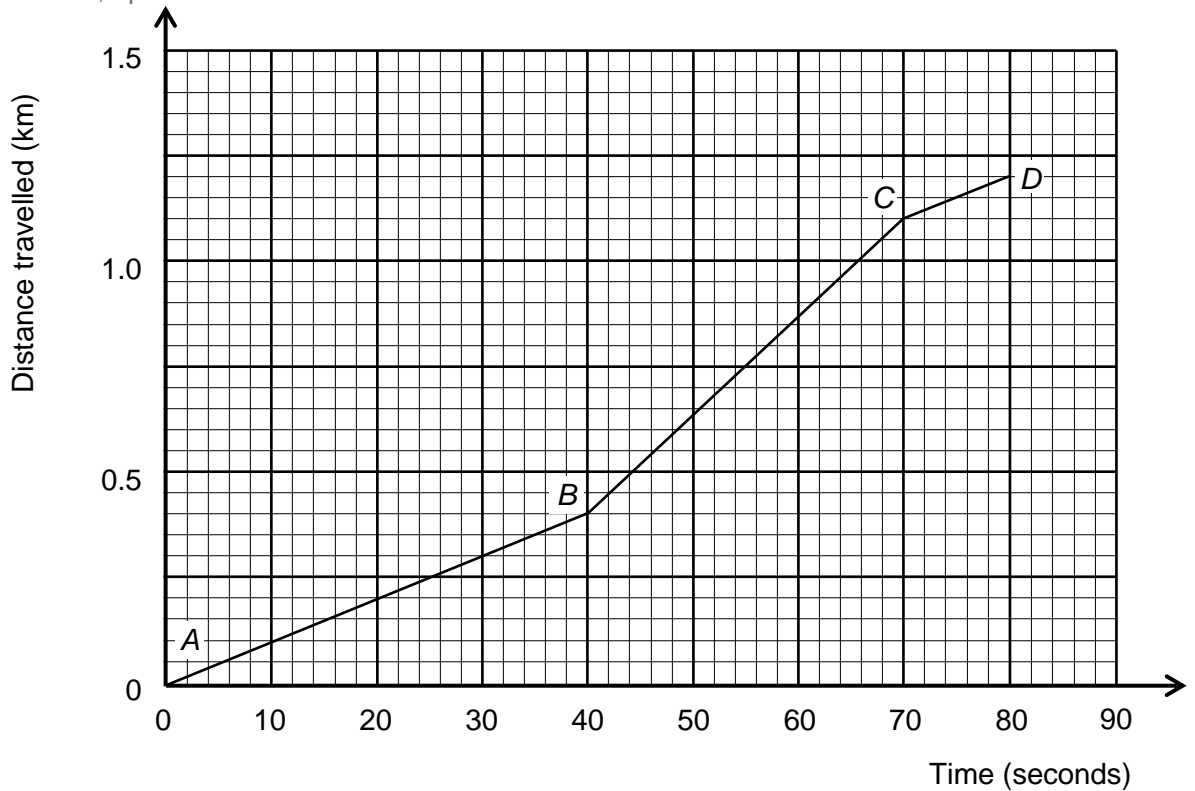
5

6

10

12

- 5 **A14** plot and interpret graphs, and graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration



The graph shows the journey of a tram between two stops. It is made up of three straight line segments, *AB*, *BC* and *CD*.

- 5 (a) How far apart are the two stops?

[1 mark]

Answer _____ km

5 (b) R14 interpret the gradient of a straight-line graph as a rate of change

What is the maximum speed at which the tram travels?

Give your answer in kilometres per hour.

[4 marks]

Answer _____ kph

- 6** **N2** understand and use place value (eg when working with very large or very small numbers, and when calculating with decimals) *including questions set in context. Knowledge and understanding of terms used in household finance, for example profit, loss, cost price, selling price, debit, credit, balance, income tax, VAT and interest rate*

Here are all the entries on Gemma's bank statement for the week ending 15 April. Three of the values are missing.

Date	Item	Credit (£)	Debit (£)	Balance (£)
8 April	Starting balance			84.58
12 April	Card payment		69.95	
13 April	Direct debit			-56.87
15 April	Salary	920.00		

- 6 (a)** Complete the bank statement.

[3 marks]

- 6 (b)** **R9** solve problems involving percentage change, including percentage increase/decrease and original value problems, and simple interest including in financial mathematics

In May, Gemma received a pay rise.

Her salary increased by 3.2%.

What was Gemma's salary in May?

[2 marks]

Answer _____

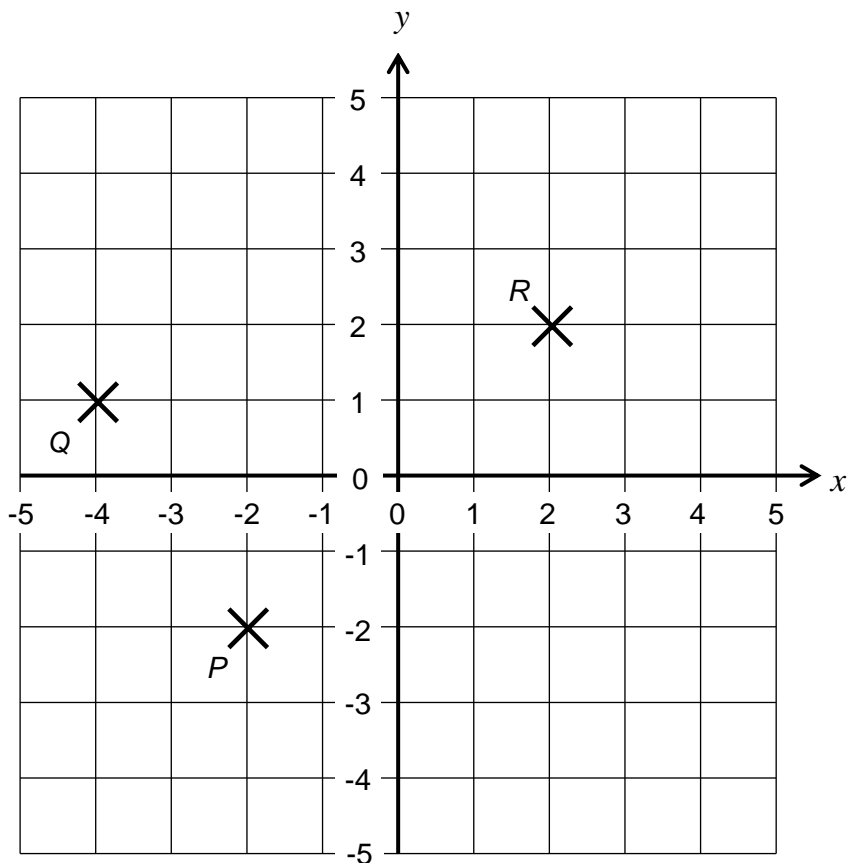
7 A8 work with coordinates in all four quadrants

P , Q , and R are three of the vertices of a parallelogram.

7 (a) Write down the co-ordinates of point Q .

[1 mark]

Answer (_____ , _____)



7 (b) G4 derive and apply the properties and definitions of: special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus

The remaining point of the parallelogram is point S .

Find the co-ordinates of the **two** possible locations for point S .

[2 marks]

Answer (_____ , _____)

and (_____ , _____)

8 (a) A17 solve linear equations in one unknown algebraically

Solve $\frac{3x - 1}{4} = 11.$

[2 marks]

Answer _____

8 (b) A17 solve linear equations in one unknown algebraically including those with the unknown on both sides of the equation

Solve $2p + 7 = 25 - p.$

You must show your working.

[3 marks]

Answer _____

- 9 **S4** interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate measures of central tendency (median, mean, mode and modal class) and spread (range, including consideration of outliers)

The table shows the numbers of passengers in 60 cars.

No car carried more than 3 passengers.

Passengers	Frequency	
0	28	
1	19	
2	8	
3	5	
Total	60	

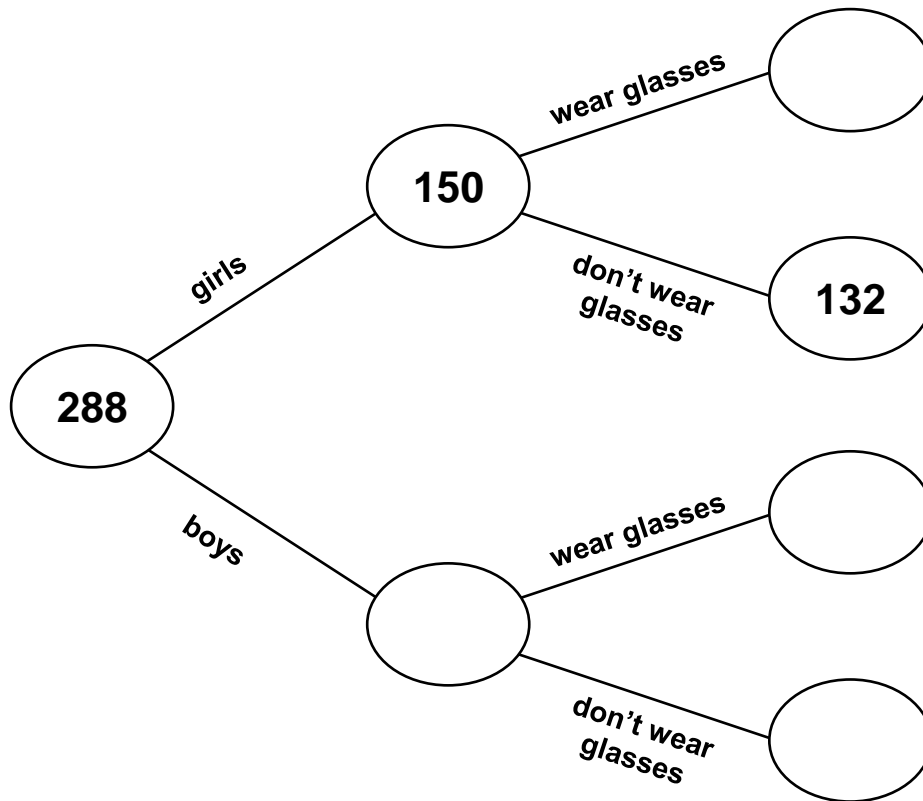
What was the mean number of passengers in each car?

[3 marks]

Answer _____ passengers

10 P1 record, describe and analyse the frequency of outcomes of probability experiments using tables and frequency trees

The frequency tree shows the numbers of students in a year group.



The ratio of students in the year group who wear glasses to those that don't wear glasses is 2 : 7.

10 (a) Complete the frequency tree.

[4 marks]

10 (b) R4 use ratio notation, including reduction to simplest form

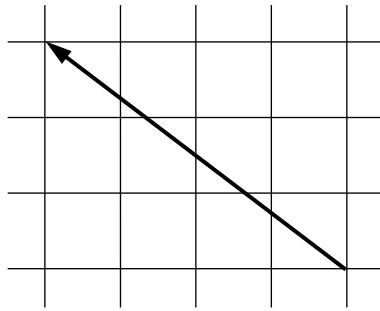
What is the ratio of boys who wear glasses to boys that don't wear glasses?

Give your answer in its simplest form.

[2 marks]

Answer _____

11 G24 describe translations as 2D vectors



The diagram shows a vector, drawn on a unit grid.

What is the vector shown by the arrow?

Circle your answer.

[1 mark]

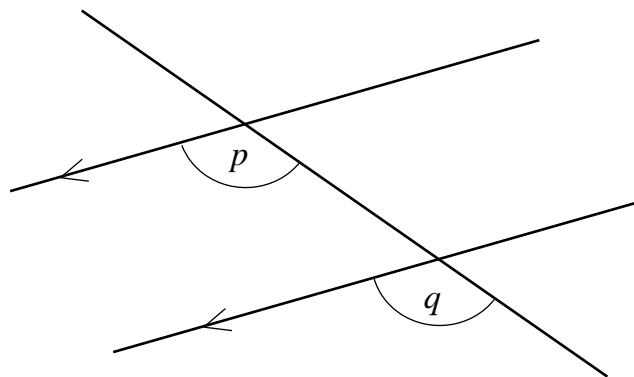
$$\begin{pmatrix} 3 \\ 4 \end{pmatrix}$$

$$\begin{pmatrix} -4 \\ 3 \end{pmatrix}$$

$$\begin{pmatrix} 3 \\ -4 \end{pmatrix}$$

$$\begin{pmatrix} -4 \\ -3 \end{pmatrix}$$

12 G3 understand and use alternate and corresponding angles on parallel lines; *colloquial terms such as Z angles are not acceptable and should not be used*



The diagram shows a pair of parallel lines, crossed by a third straight line.

What word describes the pair of angles p and q ?

Circle your answer.

[1 mark]

alternate

corresponding

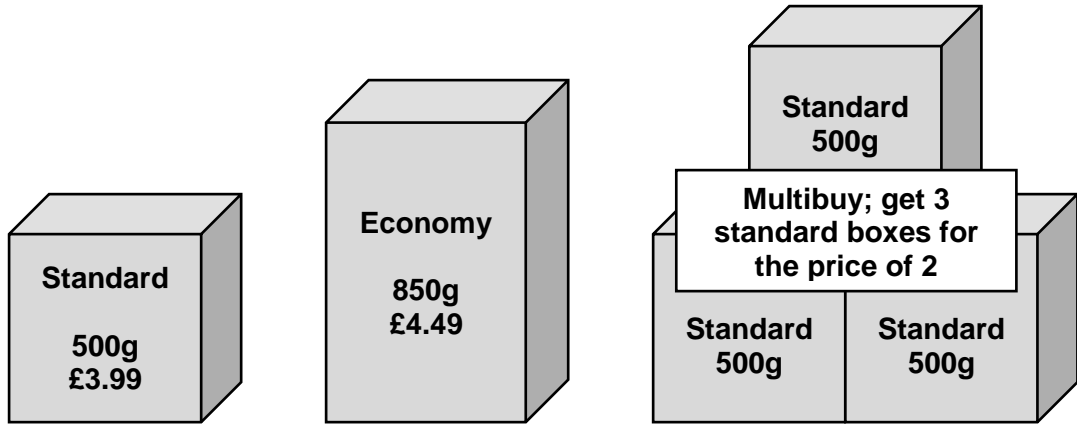
exterior

reflex

13

R6 apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing, concentrations) *including better value or best-buy problems*
R11 use compound units such as speed, rates of pay, unit pricing *including making comparisons*

Soap powder is sold in three sizes.



Which of the three offers for boxes of box soap powder is the best value for money?

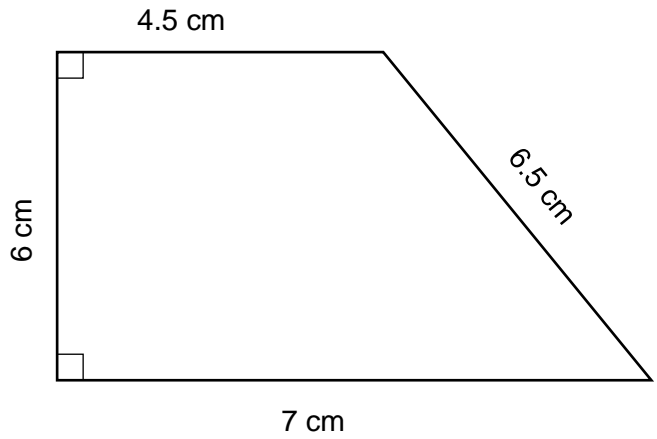
Tick a box.

You must show your working out.

[4 marks]

- Standard.
- Economy.
- Multibuy.

14 G16 know and apply formulae to calculate: area of triangles, parallelograms, trapezia



Not drawn accurately

Find the area of this trapezium.

[2 marks]

Answer _____ cm²

15 A19 solve two simultaneous equations in two variables (linear/linear) algebraically

Solve the simultaneous equations

$$3x + 4y = 3$$

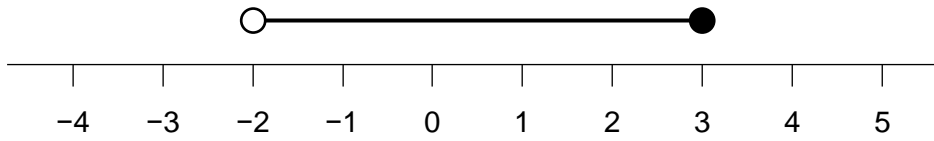
$$5x + 2y = 12$$

[3 marks]

Answer $x =$ _____

$y =$ _____

- 16** A22 solve linear inequalities in one variable; students should know the conventions of an open circle on a number line for a strict inequality and a closed circle for an included boundary.



- 16 (a)** The number line shows the solution set of an inequality.

What is the inequality?

Circle your answer.

[1 mark]

$-2 < x < 3$

$-2 < x \leq 3$

$-2 \leq x < 3$

$-2 \leq x \leq 3$

- 16 (b)** Write down all the integers that satisfy the inequality $2\frac{1}{2} < x < 8$.

[2 marks]

Answer _____

- 17 The sweets in a bag are all lemon, orange, raspberry or strawberry flavoured.
40 of the sweets are orange.
There are three times as many raspberry sweets as strawberry sweets.

The table shows the probabilities that a sweet of each flavour is taken from the bag.
Two of the probabilities are missing.

Colour	lemon	orange	raspberry	strawberry
Probability	0.44	0.2		

- 17 (a) P3 relate relative expected frequencies to theoretical probability, using appropriate language and the 0 to 1 probability scale

How many sweets are there in the bag?

[2 marks]

Answer _____

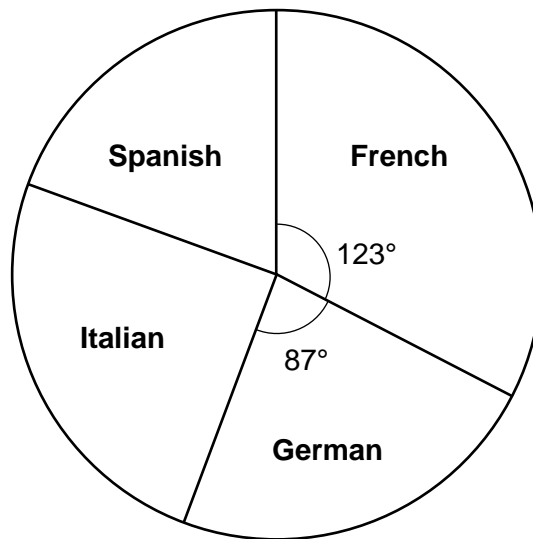
- 17 (b) P4 apply the property that the probabilities of an exhaustive set of outcomes sum to 1; apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to 1

What is the probability that a sweet chosen at random is raspberry flavoured?

[3 marks]

Answer _____

- 18** **S2** interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, vertical line charts for ungrouped discrete numerical data, and know their appropriate use



Not drawn accurately

In a year group at a school there are 240 students.

Each student studies one foreign language.

The pie chart shows this.

- 18 (a)** How many students study German?

[2 marks]

Answer _____

- 18 (b)** The numbers of students who study Italian and Spanish is in the ratio 3 : 2.

How many students study Spanish?

[3 marks]

Answer _____

- 19** R5 divide a given quantity into two parts in a given part : part or part : whole ratio; apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing, concentrations)

Concrete is made from a mixture of cement, gravel and sand.

I want to make as much concrete as possible.

The cement, gravel and sand must be in the ratio 1 : 4 : 3.

I have the following amounts of each.

cement	gravel	sand
800 kg	3 tonnes	2100 kg

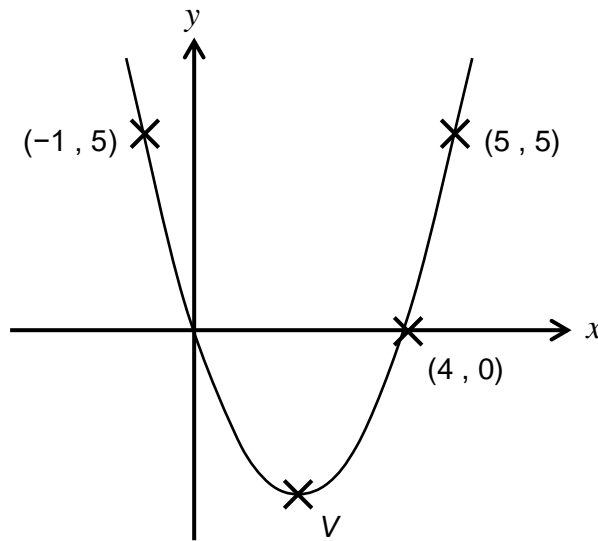
How much concrete can I make?

[4 marks]

Answer _____

20

A11 identify and interpret roots, intercepts and turning points of quadratic functions graphically including the symmetrical property of a quadratic



Not drawn accurately

The diagram shows the graph of $y = x^2 + bx$.

The co-ordinates of some of the points on the curve are shown.

20 (a) The vertex of the curve is at the point labelled V .

What are the co-ordinates of V ?

Circle your answer.

[1 mark]

- (1, -3) (2, -4) (2, 0) (2, 1)

20 (b) Use the graph to help you to solve the equation $x^2 + bx = 0$.

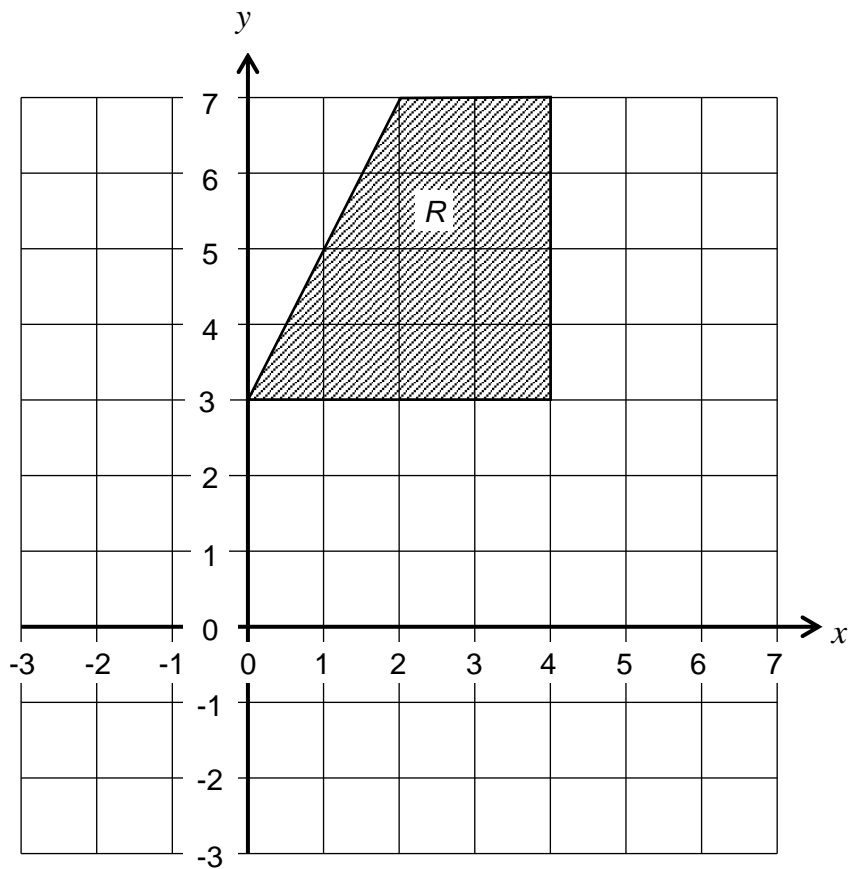
[2 marks]

Answer _____

21

G7 identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering rotation, reflection, translation and enlargement including fractional scale factors

The diagram shows a quadrilateral, Q.



Enlarge shape *R*.

Use a scale factor of $\frac{1}{2}$ and centre of enlargement (6, -3).

Label your image *S*.

[2 marks]

22 (a) A4 factorising quadratic expressions of the form $x^2 + bx + c$, including the difference of two squares

Factorise the expression $x^2 + 3x - 28$.

[1 mark]

Answer _____

22 (b) A18 solve quadratic equations algebraically by factorising

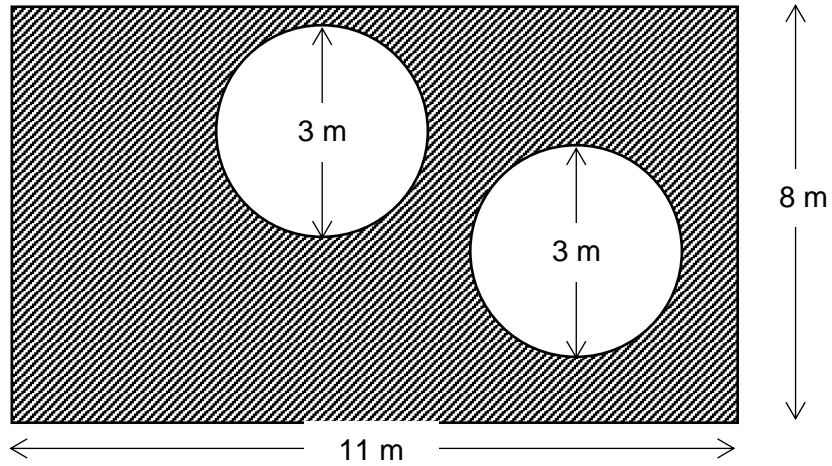
Hence solve the equation $x^2 + 3x - 28 = 0$.

[2 marks]

Answer _____

23

G17 know the formulae: circumference of a circle = $2\pi r = \pi d$; area of a circle = πr^2 ; calculate perimeters of 2D shapes, including circles, areas of circles and composite shapes



A lawn is made of a rectangle of grass, out of which two circular ponds have been dug.

The lawn is 11 metres long and 8 metres wide.
The diameter of each pond is 3 metres.

Fertiliser is sold in bags that treat 10 m^2 of grass.
Each bag of fertiliser costs £6.99.

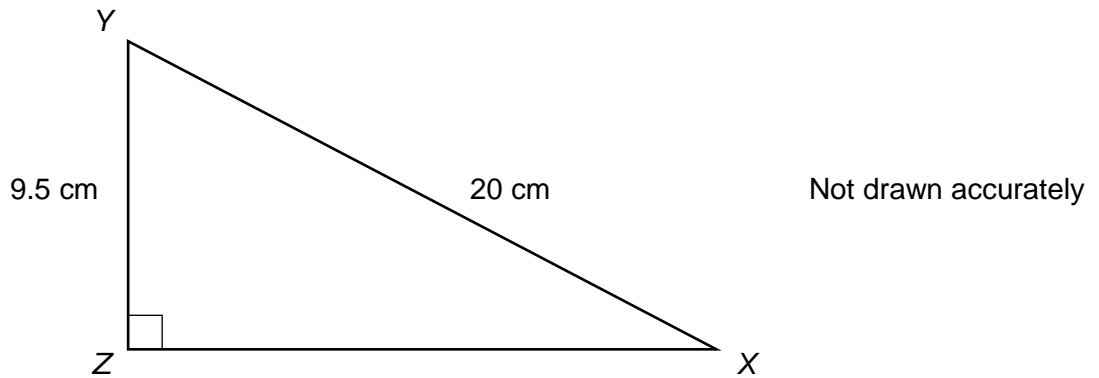
Find the cost of buying enough bags of fertiliser to treat the grass on this lawn.

[4 marks]

Answer £ _____

24 **G20** know the formula for Pythagoras' theorem, $a^2 + b^2 = c^2$, and the trigonometric ratios $\sin x = \frac{\text{opposite}}{\text{hypotenuse}}$, $\cos x = \frac{\text{adjacent}}{\text{hypotenuse}}$ and $\tan x = \frac{\text{opposite}}{\text{adjacent}}$ and apply to find angles and lengths in right-angled triangles in two dimensional figures

24 (a) Find the length of side XZ.
Give your answer to 2 decimal places.

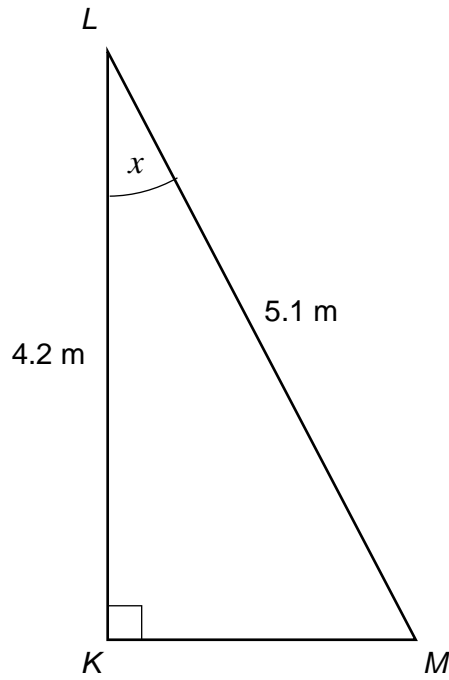


[3 marks]

Answer _____ cm

24 (b) Find the angle KLM , marked x in the diagram.

Give your answer to 1 decimal place.



Not drawn accurately

[2 marks]

Answer _____ °

25 **A5** rearrange formulae to change the subject

Rearrange the expression $\frac{a}{3} + 5 = b$
to make a the subject.

[2 marks]

26 **A6** know the difference between an equation and an identity

The identity $a(x + 2) - x \equiv 3x + 8$ is true for all values of x .
Find the value of a .

[2 marks]

Answer _____