

**Maths**  
**ReviSiON!**  
**FOR YEAR 11**

Paper 3 Foundation  
Predicted Topics  
Revision Session  
*Monday 11<sup>th</sup> June 2018*

**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

**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]**

$48 \times 8$

$48 \times 1.8$

$48 \times 0.08$

$48 \times 1.08$

*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

**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]**

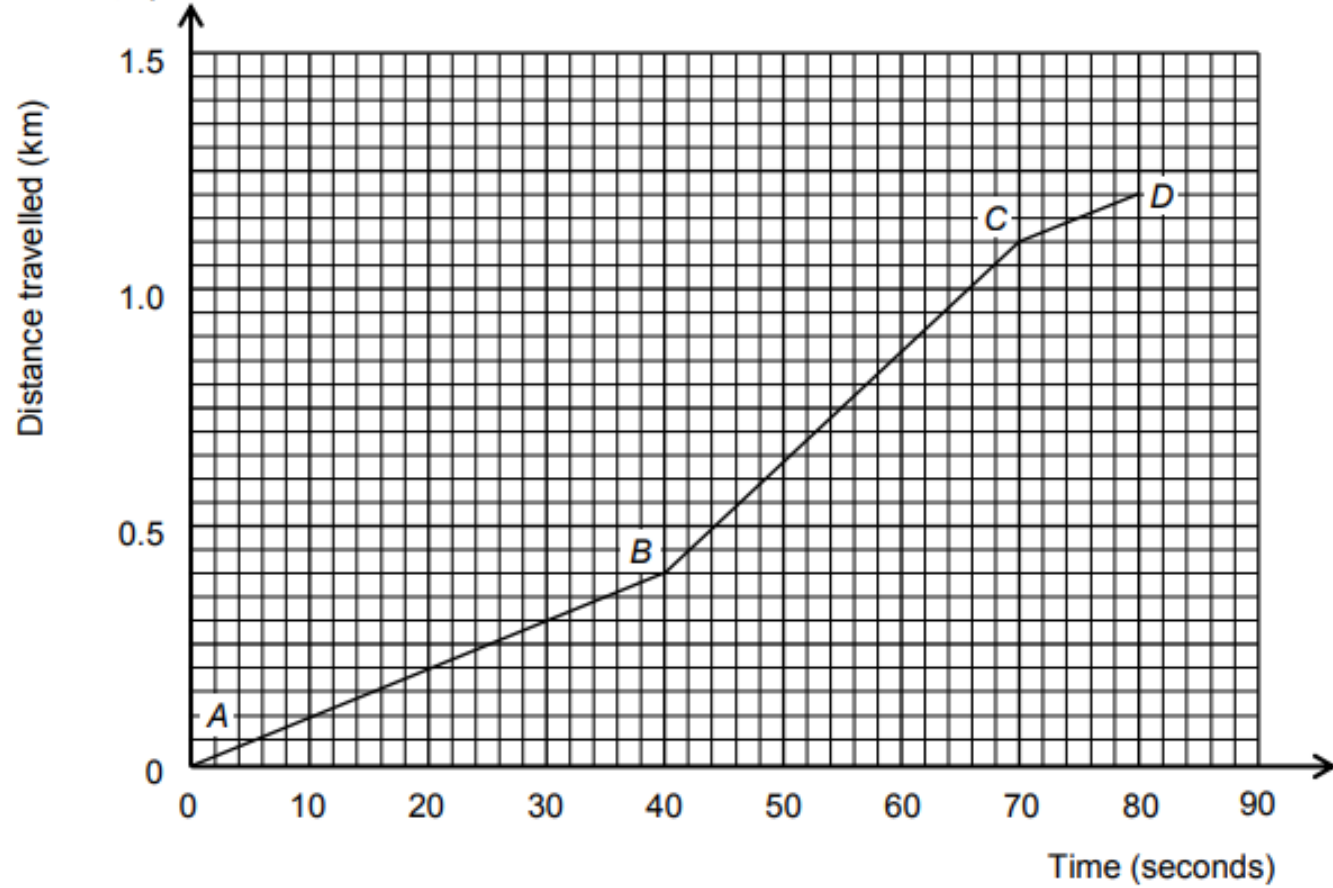
5

6

10

12

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  $CD$ .

How far apart are the two stops?

[1 mark]

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]

**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		

Complete the bank statement.

**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?

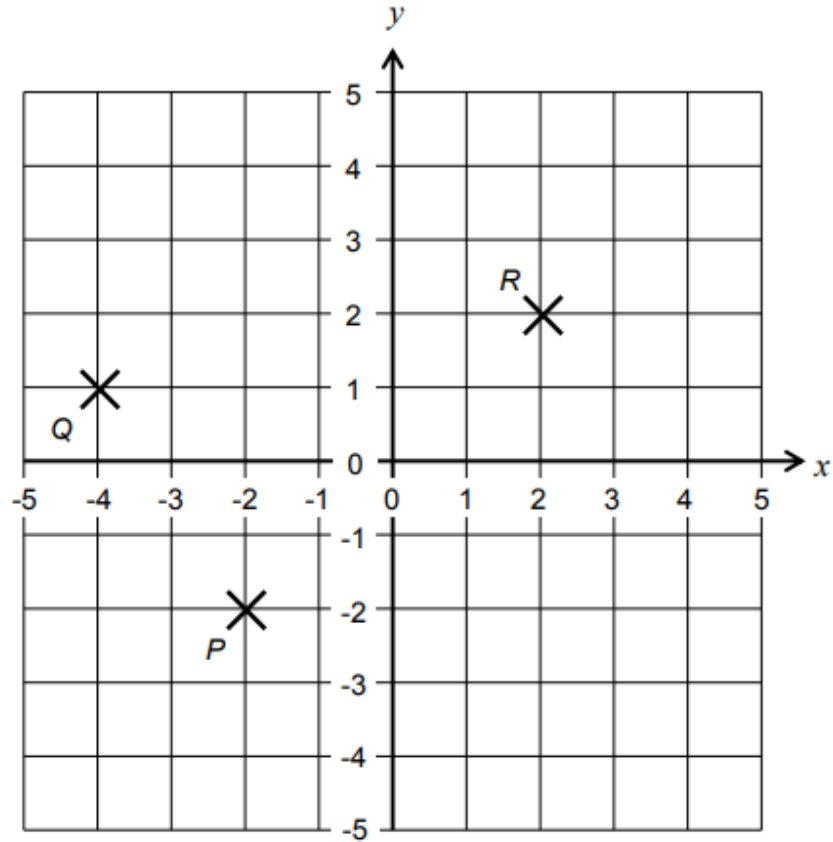
**[2 marks]**

A8 work with coordinates in all four quadrants

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

Write down the co-ordinates of point  $Q$ .

Answer ( \_\_\_\_\_ , \_\_\_\_\_ )



[1 mark]

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 ( \_\_\_\_\_ , \_\_\_\_\_ )



A17 solve linear equations in one unknown algebraically

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

**[2 marks]**

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]**

**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.

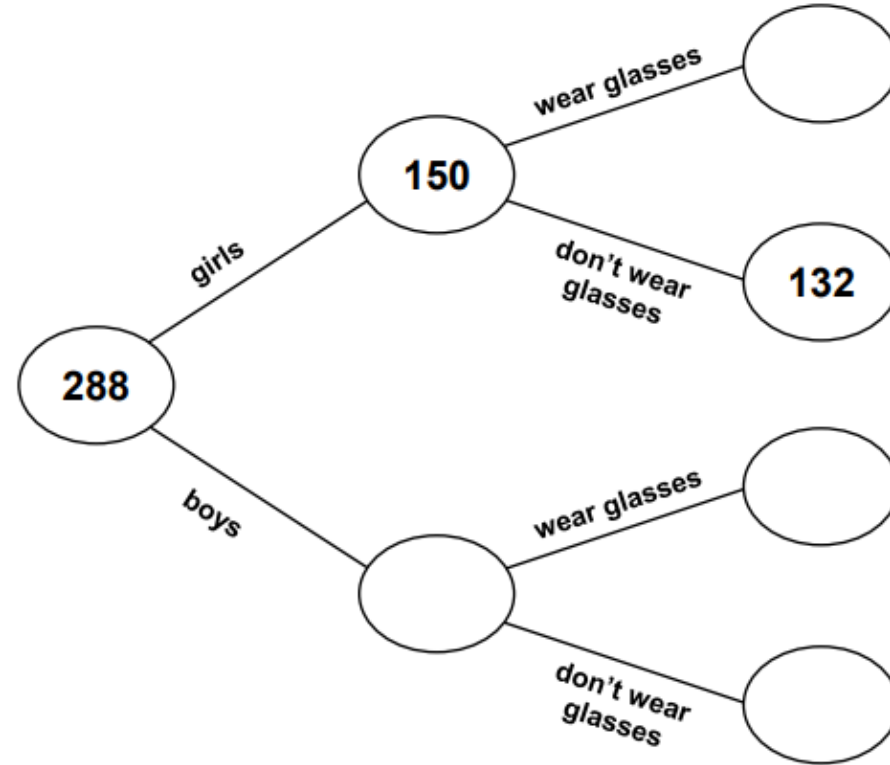
<b>Passengers</b>	<b>Frequency</b>	
0	28	
1	19	
2	8	
3	5	
Total	60	

What was the mean number of passengers in each car?

**[3 marks]**

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.

Complete the frequency tree.

[4 marks]

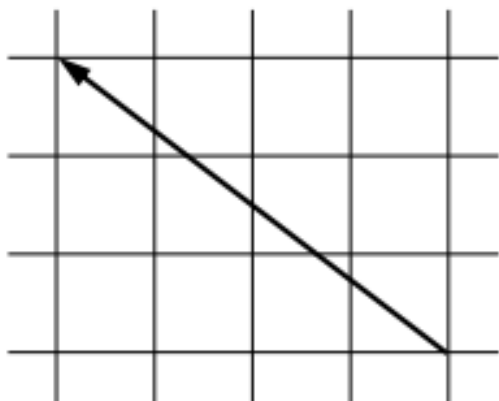
R4 use ratio notation, including reduction to simplest form

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]**

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]

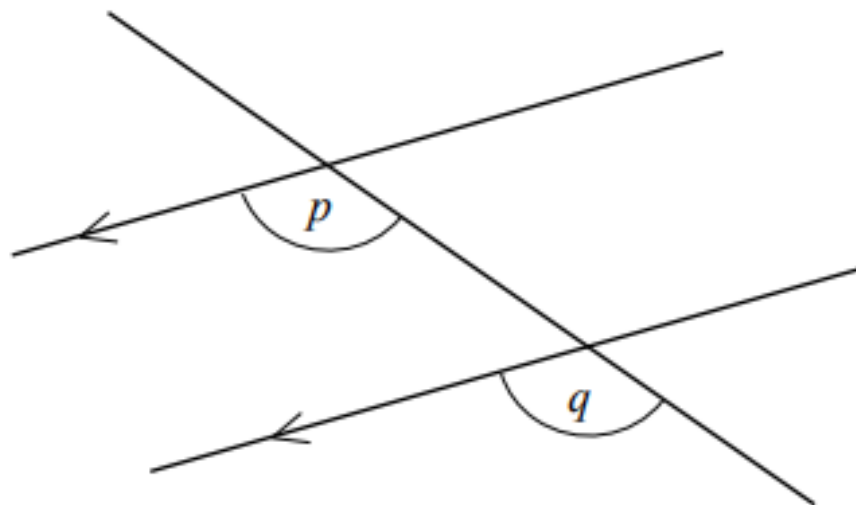
$$\begin{pmatrix} 3 \\ 4 \end{pmatrix}$$

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

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

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

**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

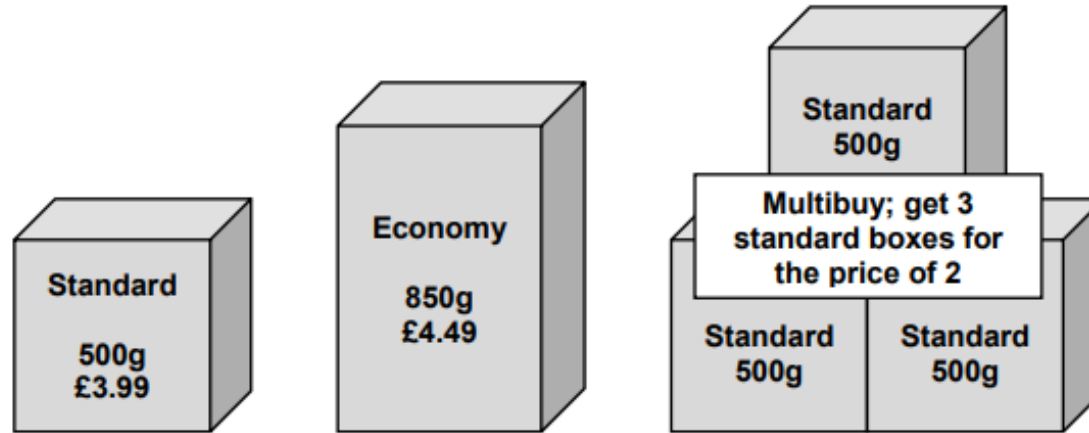
corresponding

exterior

reflex

**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]**

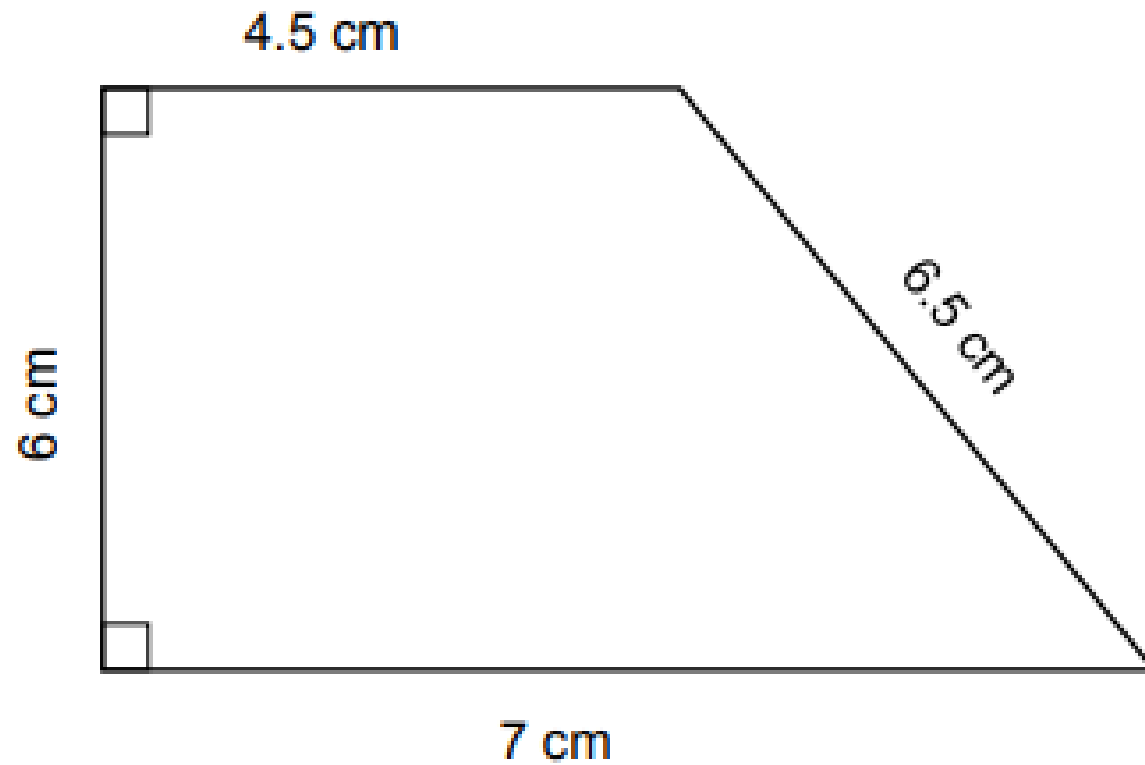
Standard.

Economy.

Multibuy.



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



Not drawn accurately

Find the area of this trapezium.

**[2 marks]**

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

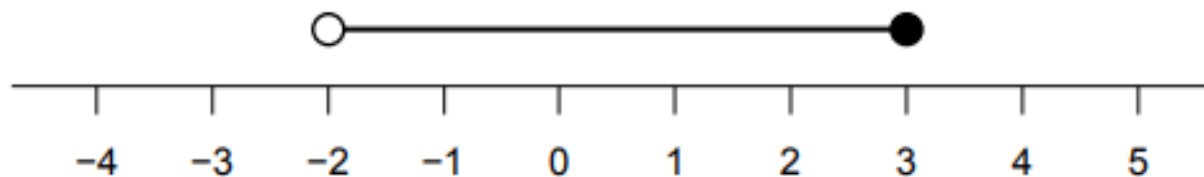
Solve the simultaneous equations

$$3x + 4y = 3$$

$$5x + 2y = 12$$

**[3 marks]**

**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.



The number line shows the solution set of an inequality.

What is the inequality?

Circle your answer.

**[1 mark]**

$-2 < x < 3$

$-2 < x \leq 3$

$-2 \leq x < 3$

$-2 \leq x \leq 3$

Write down all the integers that satisfy the inequality  $2\frac{1}{2} < x < 8$ .

**[2 marks]**

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.

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]**

<b>Probability</b>	0.44	0.2		
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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]**

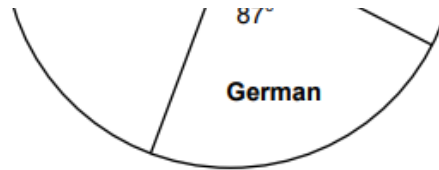
S2 interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, vertical line charts for ungrouped discrete numerical data, and know their appropriate use



The numbers of students who study Italian and Spanish is in the ratio 3 : 2.

How many students study Spanish?

**[3 marks]**



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

Each student studies one foreign language.

The pie chart shows this.

How many students study German?

**[2 marks]**

**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.

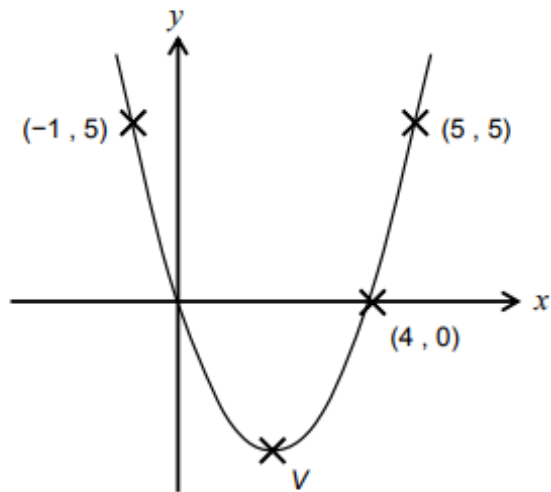
I have the following amounts of each.

cement	gravel	sand
800 kg	3 tonnes	2100 kg

How much concrete can I make?

**[4 marks]**

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



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

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

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)

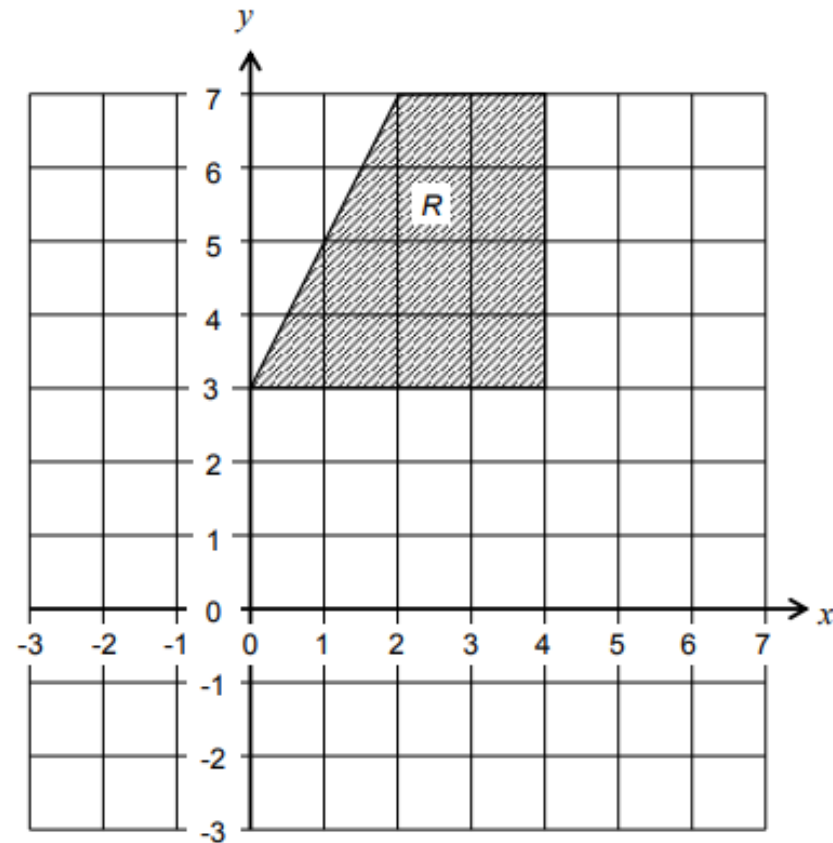
(2, 1)

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

[2 marks]

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]



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

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

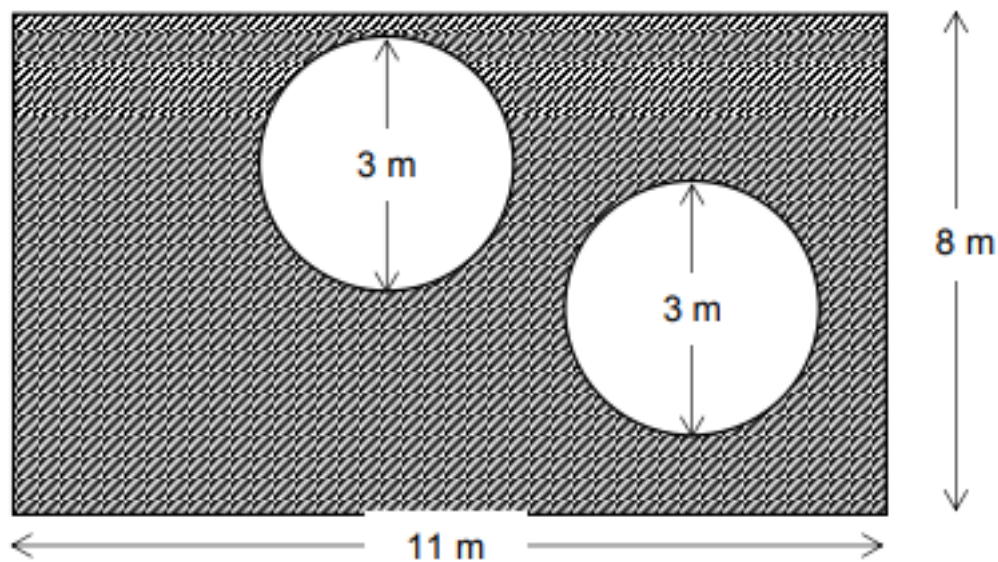
**[1 mark]**

A18 solve quadratic equations algebraically by factorising

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

**[2 marks]**

**G17** know the formulae: circumference of a circle =  $2\pi r = \pi d$ ; area of a circle =  $\pi r^2$ ; 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  $10 \text{ m}^2$  of grass.  
Each bag of fertiliser costs £6.99.

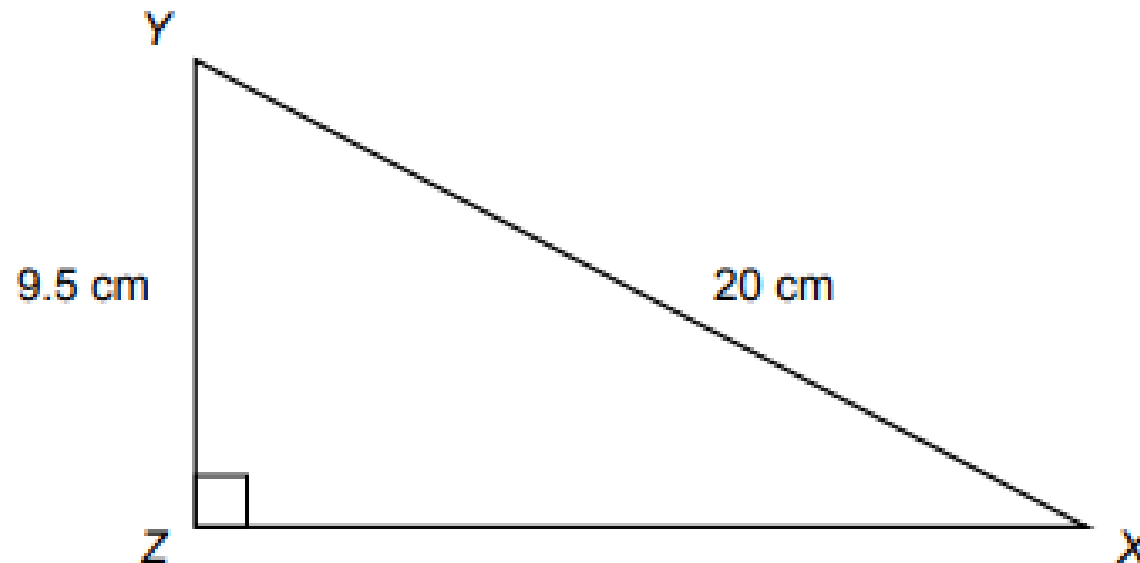
Find the cost of buying enough bags of fertiliser to treat the grass on this lawn.

**[4 marks]**

**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

Find the length of side XZ.

Give your answer to 2 decimal places.

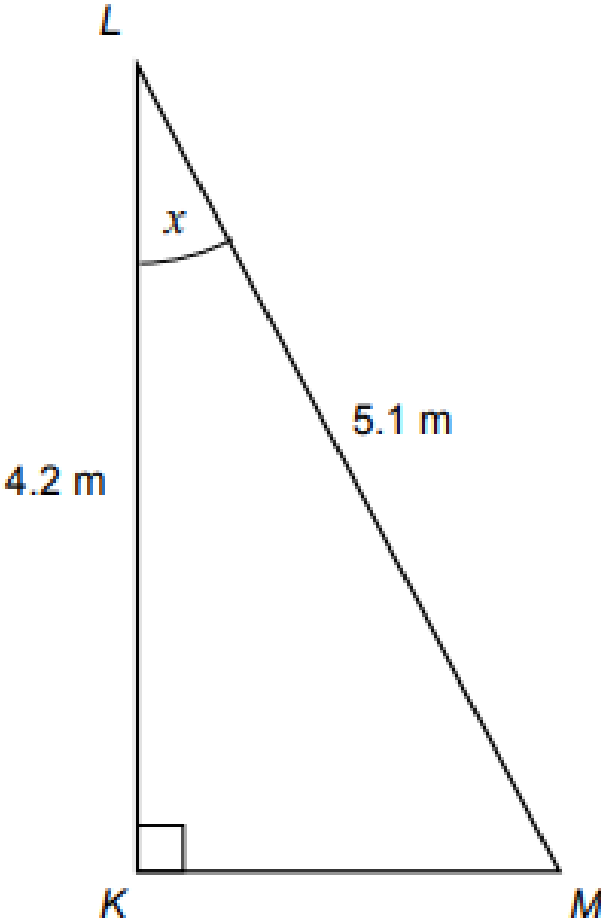


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**[3 marks]**

Find the angle  $KLM$ , marked  $x$  in the diagram.

Give your answer to 1 decimal place.



Not drawn accurately

[2 marks]

A5 rearrange formulae to change the subject

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

**[2 marks]**

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]**