

Mathematics Bridging Units

Mr S Cameron

KS5 Coordinator (Maths)



αthematics

Introduction

In order to prepare for taking A-level maths next year, you need to ensure you are fluent in all aspects of GCSE maths, particularly algebra and you need to be able to approach problems with a confident, logical mindset.

Success in A-Level Mathematics relies on an excellent attitude to learning and commitment to your studies. Whilst you are completing this transition work, if you struggle with any of the content you need to seek help from website platforms you have used during your studies, [Corbett Maths](#) (no login required) and [Sparx](#) (You would need to have an account already set up by your current school, Ripley students you have one of these).

There are 2 compulsory tasks to complete before starting in September, they are outlined on the next pages.

Equipment needed

In addition to the usual equipment, you were required to bring during your GCSEs you will need the following:

- 1) **A lever arch folder**, please note that this is not a normal slim folder but the ones which can hold 100s of pages. They can be purchased from all good supermarkets or online retailers who are named after large South American rivers.
- 2) You will also need **24 A4 dividers**. You will be required to keep an organised folder which has a contents page we will provide you with during your 1st lesson. These dividers will help with that and are required.
- 3) A more advance calculator. As part of the A-Level Mathematics and Further Mathematics course students are required to purchase a more powerful calculator that is capable of solving complex equations and is invaluable when working with statistics. There are 3 possible calculators you can choose from, some of you may already have one as they were allowed for your GCSEs.
 - a. [Casio fx-991EX](#): This is an older model which some pupils may have already purchased for their GCSEs. **It has been discontinued, please do not buy this version online it is likely a fake.**
 - b. [Casio fx-991CW](#): This is the new version of the calculator above. It does all of the same things and some additional functions as well. There is also a [Casio fx-991CW+](#) which is basically the same however is easier to navigate and use. Casio introduced this version following feedback from students and teachers.
 - c. [Casio FX-CG100](#): A more expensive calculator (approximately £120), it can do a lot of additional functions including drawing graphs which can be of benefit when trying to understand a question. They are allowed in you're A-Level exams in Exam Mode which stops students creating programs to run on it and wipes its memory. **We will be offering a 2 week window for you to purchase one through us at a reduce rate of £74.95 in September.**

Additional resources to help you prepare.

As mentioned above it is important that you start Year 12 with an excellent attitude and be prepared to go above what is necessarily set as independent learning tasks. There are plenty of resources available online, please below for a few extra ideas to help you prepare for A-Level Maths. You can scan the QR codes or click them to take you to the correct pages.

[Bridging the Gap](#)

An A-Level maths tutor who produces videos and online resources. This page gives you the basics and videos with a A-Level spin. We do not recommend paying £95 per hour for the 1-1 tuition.



[AMSP Transition to A-Level Essential Skills](#)

AMSP produce amazing resources and these were designed for students to complete independently and will develop fluency in the fundamental techniques and the key mathematical concepts that underpin A level Mathematics.



[OCRs Bridging the gap](#)

Produced by OCR (an exam board) this is a bit more old school textbook style with examples and exercises. These have some tricky questions which will test your abilities well.



[TL Maths](#)

This person produces very good videos for A-Level maths and he has made a series of bridging videos to help with the transition.



Transition Piece 1

[Task 1a – SPARX Booklet \(Compulsory\)](#)

The Sparx booklet gives you 39 questions which involve important building blocks for ALevel Maths. You must complete all 39 questions, if your school uses SPARX you are likely to still have access to it over the summer, the booklet gives you SPARX codes so you can watch the videos to help if needed.

[Task 1b- SPARX Booklet \(Deepen\) \(Optional\)](#)

This task is **optional**, however if you complete it and hand it into your maths teacher in your 1st lesson you will be entered into a prize draw for a **£10 Amazon Voucher**. In Sixth Form it is important to think about what extra things you can be doing, not just the bare minimum.

[Task 2a – Chapter 2 Surds \(Compulsory\)](#)

Taking notes is a large part of A-Level, you need to complete the notes either by using the QR code linked videos or completing them yourself.

[Task 2b – Chapter 11 Triangle Geometry \(Compulsory\)](#)

Taking notes is a large part of A-Level, you need to complete the notes either by using the QR code linked videos or completing them yourself.

During your first lesson your teacher will ask to see the notes you have made, therefore ensure these are completed and marked in green pen.

Sparx Maths

Task 1a

GCSE to A-Level



[sparxmaths.com](https://www.sparxmaths.com)

In this booklet, there are a range of questions from key topics that you will have seen in GCSE and will be helpful for AS Level and A-Level.

Each topic has three sections:

- **Introduce** questions allow you to practise the key concepts.
- **Strengthen** questions build on your knowledge of the key concepts.
- **Deepen** questions will challenge your understanding.

Unless otherwise indicated, you may use a calculator.

Use the grid below to keep track of your progress in each topic. Tick the sections you have attempted. If you use Sparx Maths you can find even more questions by searching for the Sparx topic codes in Independent Learning.

| | I | S | D | Sparx topic codes | Teacher comment |
|-------------------------------------|--------------------------|--------------------------|--------------------------|----------------------------------|-----------------|
| Surds | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | U499 U707 U281 | _____ |
| Expanding brackets | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | U768 U606 | _____ |
| Factorising quadratics | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | U178 U858 | _____ |
| Simplifying expressions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | U662 U437 | _____ |
| Operations with algebraic fractions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | U685 U457 U824 | _____ |
| Solving quadratic equations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | U228 U960 U665 U150 | _____ |
| Quadratic graphs | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | U589 U769 U601 | _____ |
| Linear simultaneous equations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | U760 U757 | _____ |
| Straight-line graphs | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | U315 U477 U848 U669 U377 U898 | _____ |
| Right-angled trigonometry | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | U283 U545 U170 | _____ |
| Further trigonometry | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | U952 U591 | _____ |

Key facts and formulae:

The Quadratic formula:

The solution of $ax^2 + bx + c = 0$

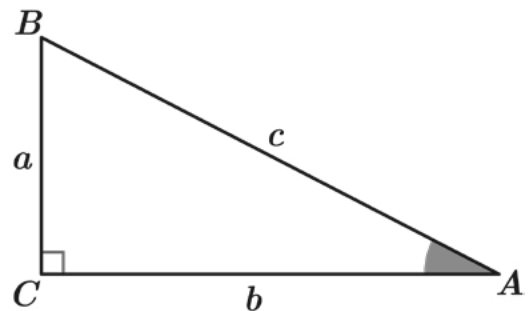
where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Trigonometry:

In any right-angled triangle ABC where a , b and c are the length of the sides and c is the hypotenuse:

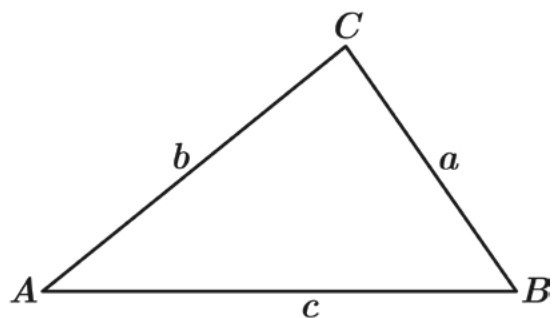
$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$



In any triangle ABC where a , b and c are the length of the sides:

$$\text{sine rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{cosine rule: } a^2 = b^2 + c^2 - 2bc \cos A$$



Q1

Expand and fully simplify $(2\sqrt{6} - 5\sqrt{2})^2$

Answer:

Q2

Rationalise the denominator of $\frac{15 + \sqrt{3}}{10\sqrt{3}}$

Give your answer as a fraction in its simplest form.

Answer:

Q3

Rationalise the denominator of $\frac{2\sqrt{7}}{3+\sqrt{7}}$
Give your answer in its simplest form.

Answer:

Q4

Write $\sqrt{12} + \frac{33}{\sqrt{3}}$ in the form $r\sqrt{3}$, where r is an integer.

Answer:

Q1

Expand and fully simplify $2(4d + 5)(3d + 1)$

Answer:

Q2

Expand and fully simplify $(x + 1)(x^2 + 3x + 5)$

Answer:

Q3 Expand and fully simplify $(3n + 4)(5n + 2) + 5(n + 7)$

Answer:

Q4 Expand and fully simplify $(t - 2)(t + 5)(t - 4)$

Answer:

Q1

Fully factorise $x^2 - 16$

Answer:

Q2

Fully factorise $2r^2 + 15r + 7$

Answer:

Q3

Fully factorise $5x^2 + 22x + 8$

Answer:

Q1

Write $\frac{(3a)^2}{54ak}$ as a fraction in its simplest form.

Answer:

Q2

Fully simplify $(64g^8h^4)^{\frac{1}{2}}$

Answer:

Q3

Fully simplify $\frac{x+2}{2x^2-31x-70}$

Answer:

Q1

Fully simplify $\frac{2}{5a+4} \times \frac{45a+36}{a}$

Give your answer as a fraction.

Answer:

Q2

Fully simplify $\frac{6x}{(5x-7)(x+1)} - \frac{1}{5x-7}$

Give your answer fully factorised.

Answer:

Q3 Write the following as a single fraction in its simplest form:

$$\frac{2x^2 - 11x + 12}{x + 5} \div (4x^2 - 6x)$$

Give your answer fully factorised.

Answer:

Q4 Fully simplify $\frac{4ab^2}{k} \times \frac{3ak}{12k} \times \frac{7}{5ab}$

Give your answer as a fraction.

Answer:

Q1 Using the quadratic formula, solve $y^2 - 6y + 7 = 0$

Give your answer in the form $a \pm \sqrt{b}$

Answer:

Q2 Solve the equation below using factorising.

$$6y^2 - 11y - 10 = 0$$

Answer:

Q3 Using the quadratic formula, solve $6x^2 - 35 = -11x$

Answer:

Q4 Solve $3r(3r - 4) = 2$
Give your answers to 2 d.p.

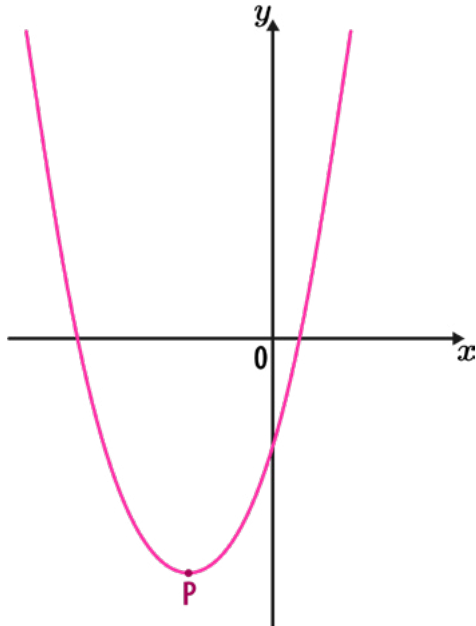
Answer:

Q1

The diagram below shows a sketch of the curve $y = x^2 + 8x - 10$

P is the turning point of the curve.

Work out the coordinates of P.



Answer: (..... ,)

Q2

Work out the coordinates of the turning point of the curve $y = x^2 - 5x + 1$

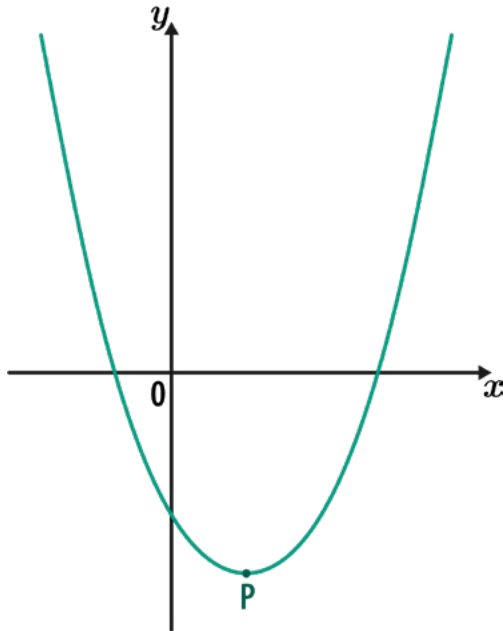
Answer: (..... ,)

Q3

The diagram below shows a sketch of the curve $y = 3x^2 - 6x - 10$

P is the turning point of the curve.

Work out the coordinates of P.



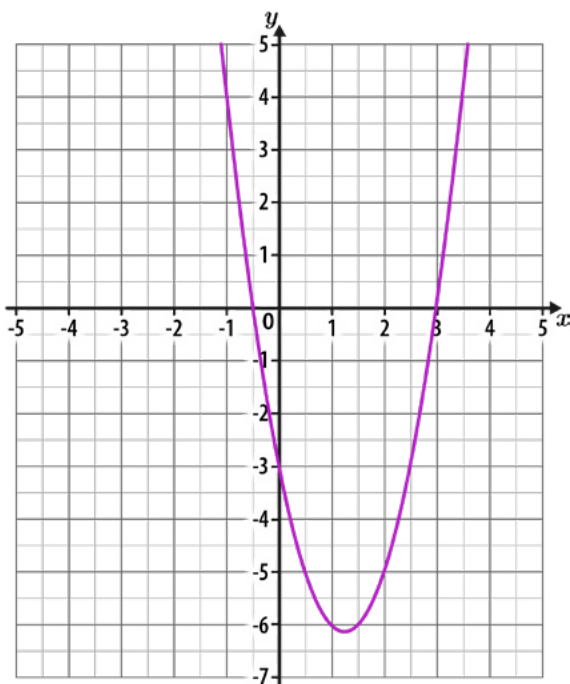
Answer: (..... ,)

Q4

The diagram below shows the graph of $y = 2x^2 - 5x - 3$

Use the diagram to estimate the solutions to $2x^2 - 5x - 3 = -2x + 2$

Give any decimal answers to 1 d.p.



Answer:

Q1

Solve the following simultaneous equations:

$$7x + 5y = 8$$

$$3x - 2y = -9$$

Answer: $x = \dots\dots\dots$ $y = \dots\dots\dots$

Q2

Solve the following simultaneous equations:

$$6x + 7y = 5$$

$$9x + 13y = -10$$

Answer: $x = \dots\dots\dots$ $y = \dots\dots\dots$

Q3

Solve the following simultaneous equations:

$$7y + 2x = \frac{23}{2}$$

$$5y + 3x = 9$$

Answer: $x = \dots\dots\dots$ $y = \dots\dots\dots$

Q4

Solve the following simultaneous equations:

$$4.6t + 8.1u = 104$$

$$3.8t - 2.7u = -8$$

Answer: $t = \dots\dots\dots$ $u = \dots\dots\dots$

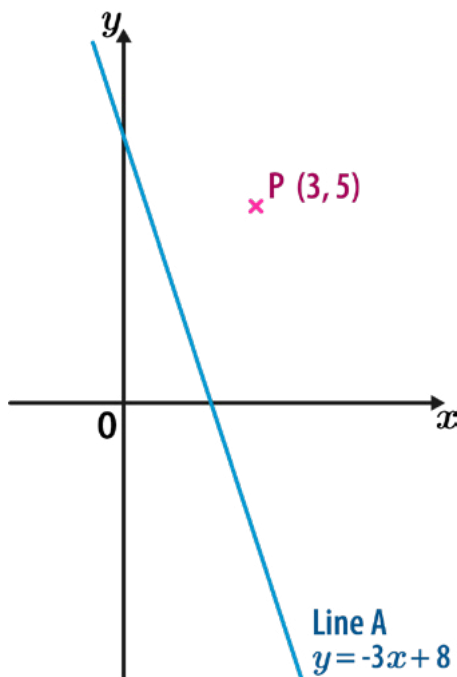
Q1

A straight line has a gradient of $-\frac{3}{4}$, and passes through the point (32, 12)
 Work out the equation of the line.

Answer:

Q2

The diagram below shows point P and Line A.
 Line B is **perpendicular** to line A and passes through point P.
 What is the equation of line B?



Answer:

Q3

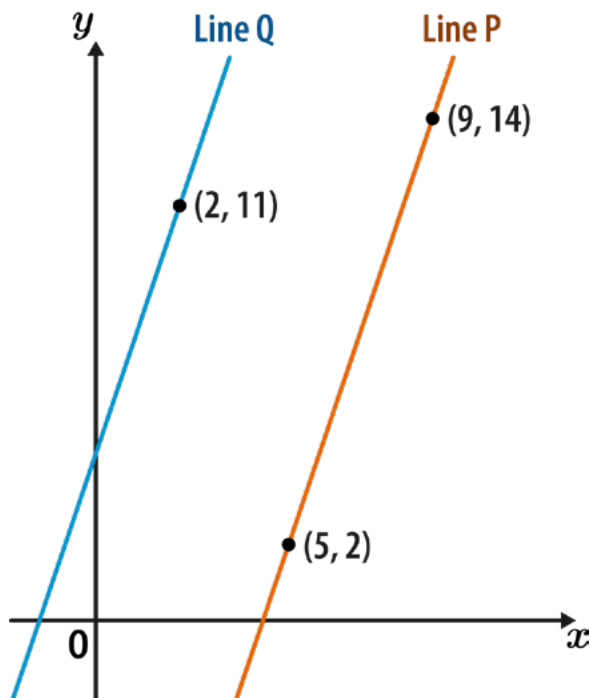
Work out the equation of the straight line that passes through $(1, -7)$ and $(6, 8)$

Answer:

Q4

The graph below shows line P and line Q.
Line Q is **parallel** to line P.

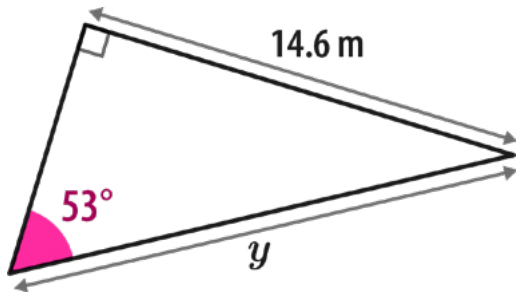
What is the equation of line Q?



Answer:

Q1

Calculate the length y .
Give your answer to 2 d.p.

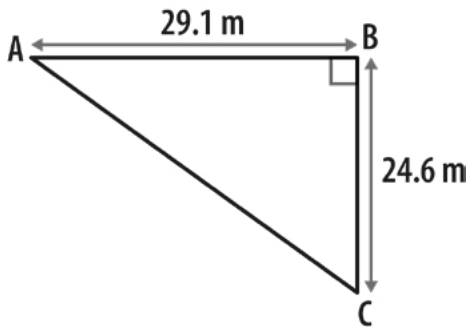


Not drawn accurately

Answer: m

Q2

Calculate the size of angle BAC.
Give your answer to 1 d.p.

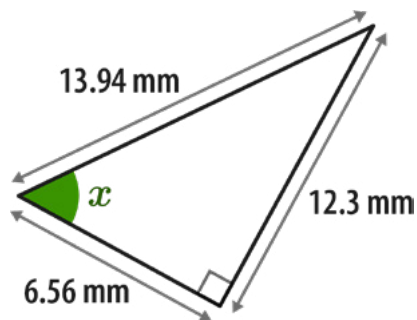


Not drawn accurately

Answer: °

Q3

What is the size of angle x ?
Give your answer to 1 d.p.

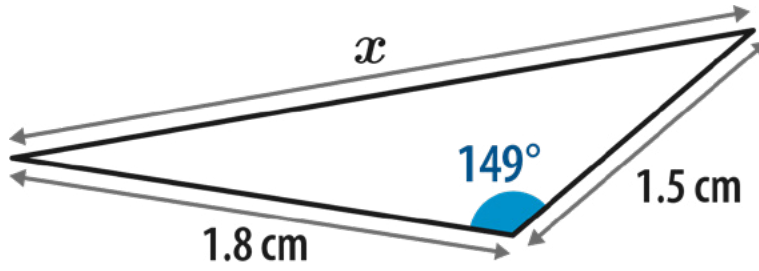


Not drawn accurately

Answer: °

Q1

Work out length x .
Give your answer to 1 d.p.

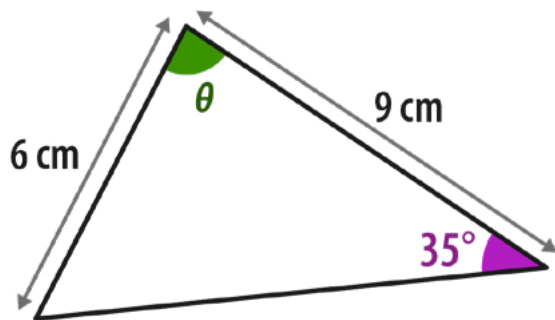


Not drawn accurately

Answer: cm

Q2

All the angles in the triangle below are acute.
Calculate the angle θ to 1 d.p.



Not drawn accurately

Answer: $^\circ$

Sparx Maths

Task 1b

GCSE to A-Level



[sparxmaths.com](https://www.sparxmaths.com)

In this booklet, there are a range of questions from key topics that you will have seen in GCSE and will be helpful for AS Level and A-Level.

Each topic has three sections:

- **Introduce** questions allow you to practise the key concepts.
- **Strengthen** questions build on your knowledge of the key concepts.
- **Deepen** questions will challenge your understanding.

Unless otherwise indicated, you may use a calculator.

Use the grid below to keep track of your progress in each topic. Tick the sections you have attempted. If you use Sparx Maths you can find even more questions by searching for the Sparx topic codes in Independent Learning.

| | I | S | D | Sparx topic codes | Teacher comment |
|-------------------------------------|-----------------------|-----------------------|-----------------------|----------------------------------|-----------------|
| Surds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | U499 U707 U281 | _____ |
| Expanding brackets | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | U768 U606 | _____ |
| Factorising quadratics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | U178 U858 | _____ |
| Simplifying expressions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | U662 U437 | _____ |
| Operations with algebraic fractions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | U685 U457 U824 | _____ |
| Solving quadratic equations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | U228 U960 U665 U150 | _____ |
| Quadratic graphs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | U589 U769 U601 | _____ |
| Linear simultaneous equations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | U760 U757 | _____ |
| Straight-line graphs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | U315 U477 U848 U669 U377 U898 | _____ |
| Right-angled trigonometry | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | U283 U545 U170 | _____ |
| Further trigonometry | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | U952 U591 | _____ |

Key facts and formulae:

The Quadratic formula:

The solution of $ax^2 + bx + c = 0$

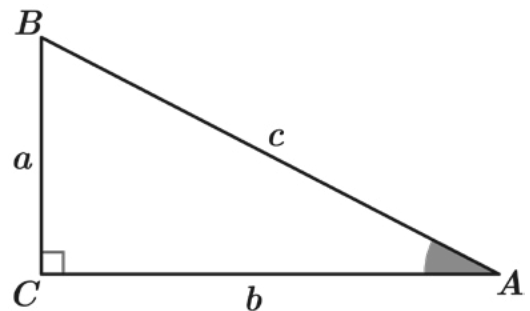
where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Trigonometry:

In any right-angled triangle ABC where a , b and c are the length of the sides and c is the hypotenuse:

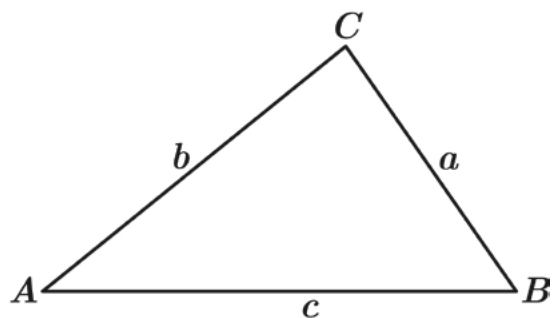
$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$



In any triangle ABC where a , b and c are the length of the sides:

$$\text{sine rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{cosine rule: } a^2 = b^2 + c^2 - 2bc \cos A$$



Q1

Expand and fully simplify $(4 + \sqrt{7})^2 - (4 - \sqrt{7})^2$

Answer:

Q2

Work out the value of x in the equation below.

$$x(\sqrt{11} - 2) = 21$$

Give your answer in the form $a + b\sqrt{11}$, where a and b are integers.

Answer:

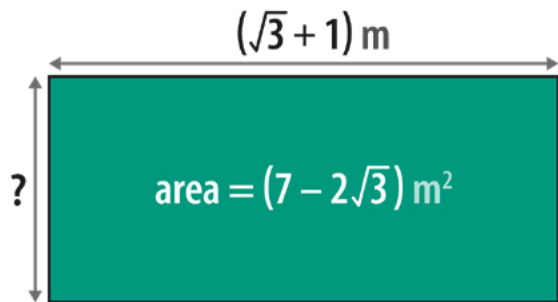
Q3

Given that h is a prime number, rationalise the denominator of $\frac{5h - \sqrt{h}}{\sqrt{h}}$
 Give your answer in its simplest form.

Answer:

Q4

Calculate the unknown side length, in metres, of the rectangle below.
 Give your answer in its simplest form, rationalising the denominator if necessary.



Answer: m

Q1

Expand and fully simplify $(2x + 5)(4x - 3)(5x - 4)$

Answer:

Q2

Work out the values of a , b and c in the identity below.

$$(3x - 1)(x + 2)(ax + b) \equiv 15x^3 + 16x^2 - 25x + c$$

Answer: $a = \dots\dots\dots$ $b = \dots\dots\dots$ $c = \dots\dots\dots$

Q3

Write the following expression in the form $\frac{1}{ax^b} + \frac{1}{cy^d}$ where a, b, c, and d are integers.

$$\left(\frac{1}{5x} + \frac{1}{4y}\right)\left(\frac{1}{25x^2} - \frac{1}{20xy} + \frac{1}{16y^2}\right)$$

Answer:

Q4

Show that $(x^2 + 1)(y^2 + 4) \equiv (xy - 2)^2 + (2x + y)^2$

Q1

Fully factorise $49h^2 - m^2$

Answer:

Q2

Fully factorise $7b - b^2 - 10$

Answer:

Q3

Fully factorise $4k^2 - 25n^2 - (2k - 5n)^2$

Answer:

Q1 Work out the values of a , b and c in the equality below.

$$\frac{2x^{20}y^4 \times 12x^4y^{26}}{(2xy^2)^3} = ax^by^c$$

Answer: $a = \dots\dots\dots$ $b = \dots\dots\dots$ $c = \dots\dots\dots$

Q2 Work out what expression should replace the ? in the equivalent fractions below.

$$\frac{?}{12r^4(t+6)} = \frac{2n}{3r}$$

Answer: ? =

Q3 $\frac{ax^2 + bx + c}{dx^2 - 25}$ simplifies to give $\frac{x - 4}{2x - 5}$

Work out the values of a , b , c and d in the original fraction.

Answer: $a = \dots\dots\dots$ $b = \dots\dots\dots$ $c = \dots\dots\dots$ $d = \dots\dots\dots$

Q1

Fully simplify $\frac{7}{36 - x^2} - \frac{3}{6 + x}$

Give your answer fully factorised.

Answer:

Q2

Write the following as a single fraction in its simplest form:

$$6 - (x + 4) \div \frac{x^2 + 11x + 28}{x - 7}$$

Give your answer fully factorised.

Answer:

Q1

Solve $x(x + 4) - 4(5x + 9) = 0$

Answer:

Q2

Jessica thinks of a positive number, n , which is less than 1
She adds this number to its reciprocal and gets 2.9

Work out the value of n .

Give your answer as a fraction in its simplest form.

Answer:

Q3

Solve $\frac{4}{y-1} - \frac{5}{y+2} = \frac{3}{y}$

Answer:

Q4

$$x = \frac{-3 \pm \sqrt{29}}{2}$$

There is only one equation of the form $x^2 + bx + c = 0$ that gives these values of x as solutions.

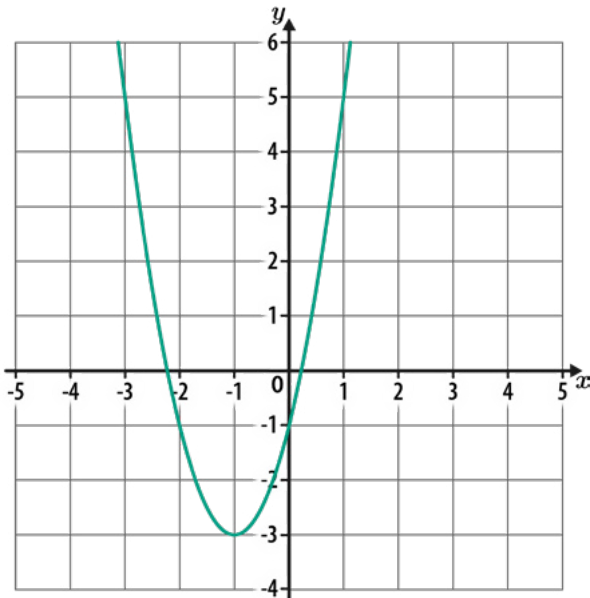
Work out the values of b and c .

Answer: $b =$ $c =$

Q1

The diagram below shows the graph of $y = 2x^2 + 4x - 1$
 The equation $2x^2 + 4x - 1 = k$ has solutions at $x = -3$ and $x = 1$

What is the value of k ?



Answer: $k = \dots\dots\dots$

Q2

A curve has the equation $y = x^2 + ax + b$, where a and b are numbers.
 The turning point of the curve is $(5, 4)$

Work out the values of a and b .

Answer: $a = \dots\dots\dots$ $b = \dots\dots\dots$

Q3

A curve has the equation $y = -x^2 + 16x - 65$

a) Work out the turning point of the curve.

Answer: a) (..... ,)

b) By considering the position of the turning point and the shape of the curve, work out how many real roots $y = -x^2 + 16x - 65$ has.

Answer: b)

Q1

Solve the following simultaneous equations:

$$3x = 3 - 4y$$

$$12y + 11 = -5x$$

Answer: $x = \dots\dots\dots$ $y = \dots\dots\dots$

Q2

Find the values of x , y and a by solving the following simultaneous equations:

$$6x - 7y = -10$$

$$12x - 5y = 16$$

$$2x + ay = 10$$

Answer: $x = \dots\dots\dots$ $y = \dots\dots\dots$ $a = \dots\dots\dots$

Q3

Solve the following simultaneous equations:

$$\frac{4}{7x - 4} = \frac{1}{6y}$$

$$\frac{5x}{3y + 2} = 4$$

Answer: $x = \dots\dots\dots$ $y = \dots\dots\dots$

Q4

Solve the following simultaneous equations:

$$2^x = 4^{(7 - 2y)}$$

$$3^{(5x - 13y)} = 81$$

Answer: $x = \dots\dots\dots$ $y = \dots\dots\dots$

Q1

Write an expression, in terms of h , for the gradient of a line **perpendicular** to the line segment joining $(3h, 20)$ to $(6h, 8)$

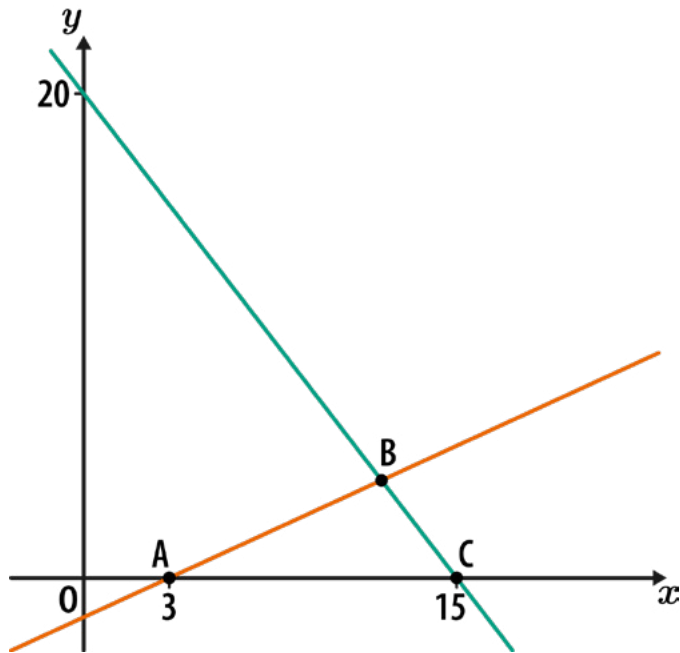
Give your answer as a fully simplified fraction.

Answer:

Q2

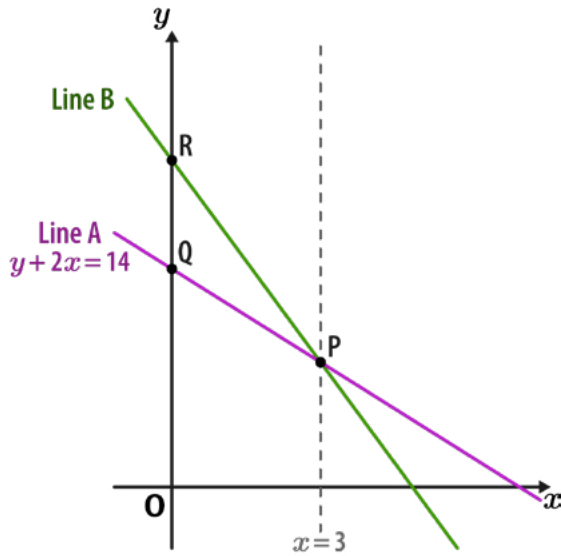
The triangle ABC has an area of 24 square units.

What are the coordinates of point B?



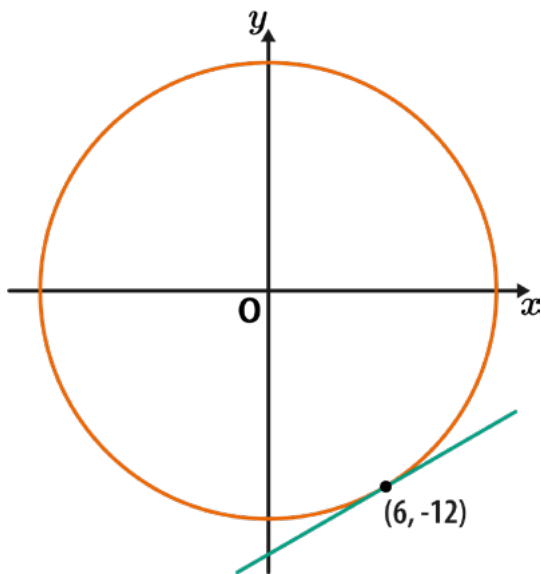
Answer: (..... ,)

Q3 Line A has the equation $y + 2x = 14$
 The gradient of line B is twice the gradient of line A.
 Work out the ratio of the length of OQ to the length of OR.
 Give your answer in its simplest form.



Answer:

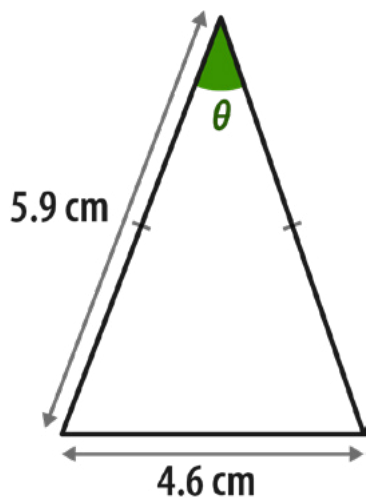
Q4 A circle, centre O, passes through the point (6, -12), as shown.
 Work out the equation of the tangent to the circle at this point.
 Give your answer in the form $y = mx + c$, where m and c are integers or fractions in their simplest form.



Answer:

Q1

Calculate the size of angle θ .
Give your answer to 1 d.p.



Not drawn accurately

Answer:^o

Q2

Work out the length y .
Give your answer to 2 d.p.

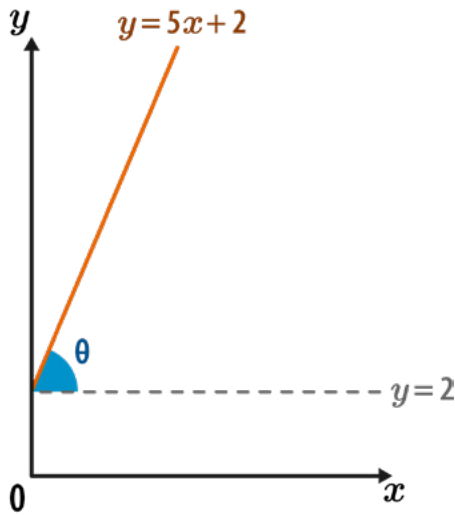


Not drawn accurately

Answer: cm

Q3 The graph below shows the line with equation $y = 5x + 2$
The axes both have the same scale.

Calculate the size of angle θ .
Give your answer in degrees to the nearest integer.

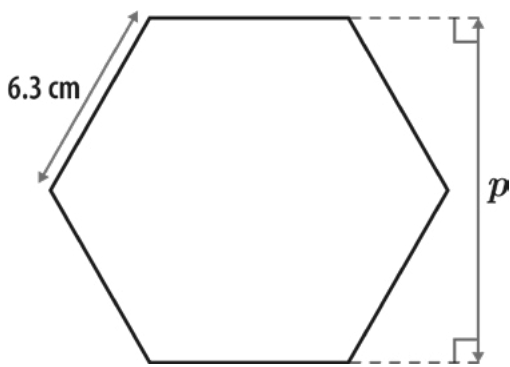


Not drawn accurately

Answer: °

Q4 The shape below is a regular hexagon.

Use trigonometry to calculate the distance p .
Give your answer in centimetres to 2 d.p.

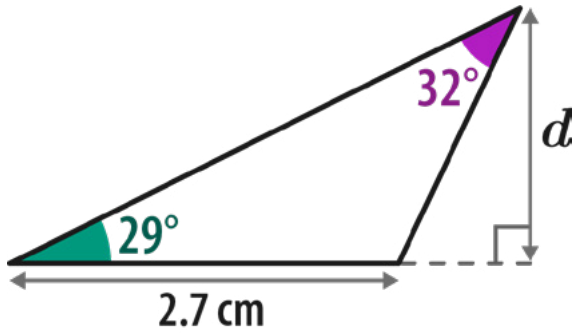


Not drawn accurately

Answer: cm

Q1

Calculate the length d .
Give your answer to 2 s.f.

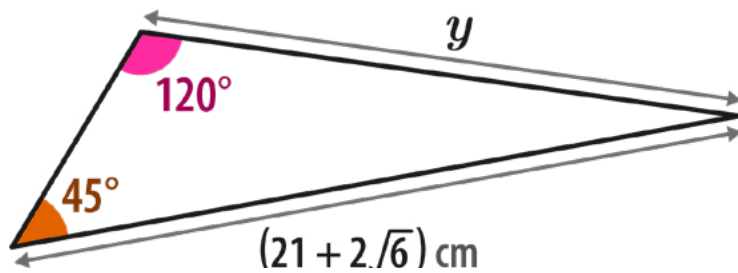


Not drawn accurately

Answer: cm

Q2

Work out the length y in the triangle below.
Give your answer in its simplest form, rationalising the denominator if necessary.

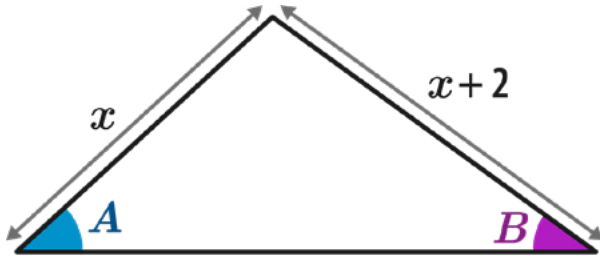


Not drawn accurately

Answer: cm

Q3 Using the information below, work out the value of x .

$$\sin A = \frac{4}{5} \qquad \sin B = \frac{3}{4}$$

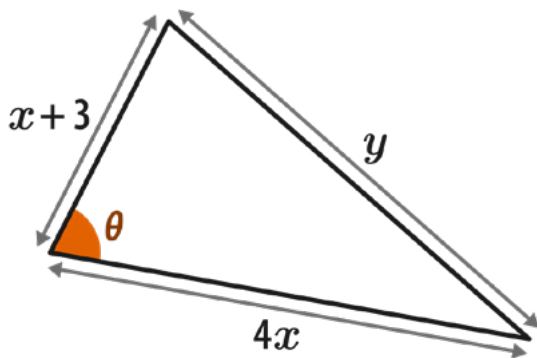


Not drawn accurately

Answer:

Q4 Given that $\cos\theta = \frac{1}{8}$ in the triangle below, show that $y^2 = ax^2 + bx + c$ where a , b and c are numbers.

What are the values of a , b and c ?



Not drawn accurately

Answer: $a =$ $b =$ $c =$

Chapter 2 **Indices & Surds**

Transition Piece 1 **Task 2a**

Video 2 - Simplifying

1) $\sqrt{18}$

2) $\sqrt{200}$

3) $\sqrt{48}$

4) $\frac{\sqrt{12}}{\sqrt{300}}$

5) $\sqrt{24} \times \sqrt{150}$

Video 3 - Adding/Subtracting Surds

1) $\sqrt{20} + \sqrt{180}$

2) $\sqrt{63} - \sqrt{28}$

3) $\sqrt{108} + \sqrt{72}$

Chapter 2 **Indices & Surds**

Transition Piece 1 **Task 2a**

Video 4 – Expanding brackets

1) $\sqrt{3}(\sqrt{2} + 5)$

Video 5 – Expanding brackets

1) $6(\sqrt{3} + \sqrt{6})$

2) $\sqrt{5}(8 - \sqrt{7})$

3) $\sqrt{6}(\sqrt{15} - 2\sqrt{2})$

4) $\sqrt{12}(\sqrt{50} + 3\sqrt{10})$

Video 6 – Expanding Double Brackets

1) $(2 + \sqrt{2})(3 - \sqrt{5})$

Video 7 – Expanding Double brackets

1) $(2 - \sqrt{5})(2 + \sqrt{5})$

2) $(3 + \sqrt{2})(2 + \sqrt{3})$

3) $(\sqrt{2} + 1)(\sqrt{3} - \sqrt{5})$

4) $(2\sqrt{3} + 3\sqrt{5})(2\sqrt{2} - 3\sqrt{5})$

Video 8 – Rationalising the Denominator

1) Why is rationalising the denominator a good idea?

2) $\frac{1}{\sqrt{2}}$

Video 9 – Rationalising the Denominator

1) $\frac{2}{\sqrt{3}}$

2) $\frac{10}{\sqrt{5}}$

3) $\frac{9}{2\sqrt{3}}$

[Video 10](#) – More Complex Rationalising the Denominator

1) $\frac{1}{1+\sqrt{2}}$

2) What would multiplying by $\frac{1+\sqrt{2}}{1+\sqrt{2}}$ not work?

3) What mathematical property are you utilising here to eliminate the Surds from the denominator?

[Video 11](#) – More Complex Rationalising the Denominator

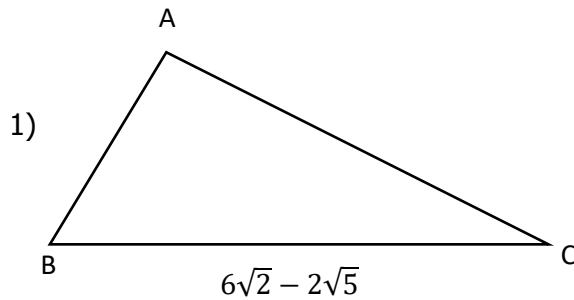
1) $\frac{2}{\sqrt{2}+2}$

2) $\frac{3}{4-\sqrt{5}}$

3) $\frac{1+\sqrt{2}}{3-\sqrt{2}}$

4) $\frac{4+2\sqrt{3}}{3+3\sqrt{2}}$

Video 12 – Rationalising the Denominator Problem Solving



$\triangle ABC$ has area 5. Find the exact perpendicular height of the triangle

- 2) Rationalise the denominator of $\frac{1}{\sqrt{2} + \sqrt{3} - \sqrt{5}}$

Video 13 – Solving Equations Involving Surds

- 1) Solve $x\sqrt{2} + 5 = x - \sqrt{2}$

[Video 14](#) – More Examples of Solving Equations with Surds

Solve:

1) $\sqrt{2}(x - 3) = 4(x + \sqrt{2})$

2) $x - \sqrt{48} = 2\sqrt{3} - 2x$

3) $x\sqrt{18} - 4 = \sqrt{8}$

4) $x\sqrt{5} + 2 = \sqrt{20}(x - 1)$

[Video 15](#) – Simultaneous Equations and Surds

Find the exact coordinates of intersection of the two lines:

$$y = \sqrt{2}x + \sqrt{3} - 2$$

$$y = \sqrt{3}x + \sqrt{3} - \sqrt{6}$$

Chapter 2 **Indices & Surds**

Transition Piece 1 **Task 2a**

Video 16 – Prove a Surd is Larger than 2

Prove that $\frac{1}{3\sqrt{2}-4} > 2$

Chapter 11

Triangle Geometry

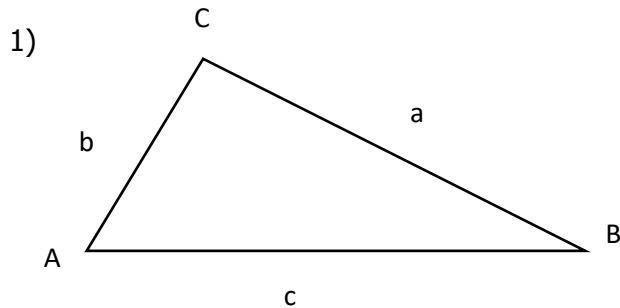
Transition Piece 1

Task 2b

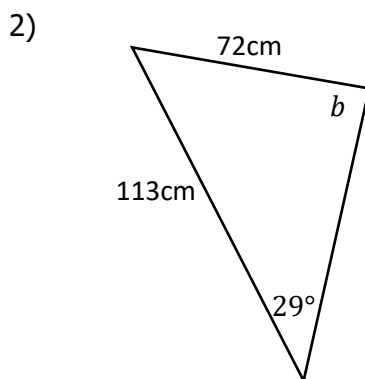
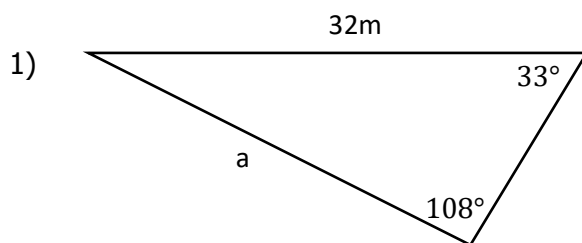
Video 1 - Proof of Sine Rule



Click or Scan the QR to take you to a full playlist for the videos (you will need to skip the 1st 6 videos)



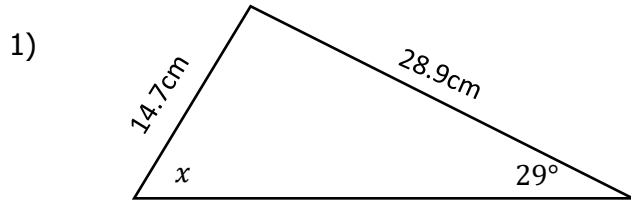
Video 2 - Using the Sine Rule



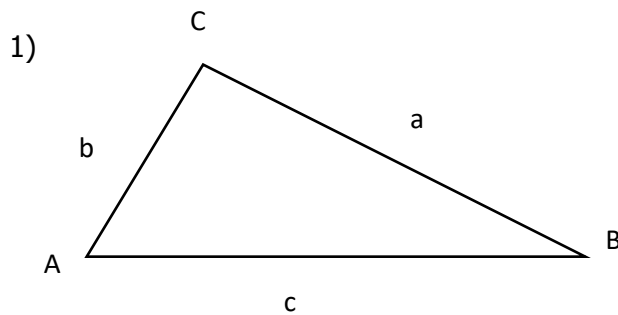
Chapter 11 **Triangle Geometry**

Transition Piece 1 **Task 2b**

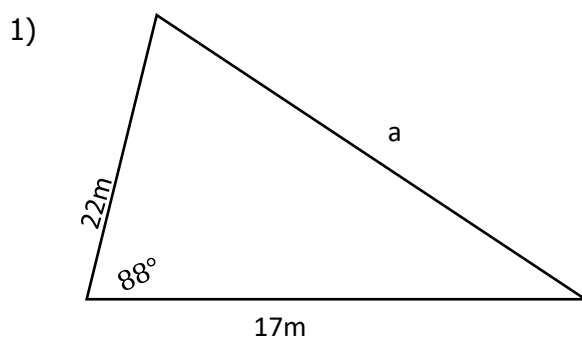
Video 3 – Two triangles



Video 4 – Proof of Cosine Rule

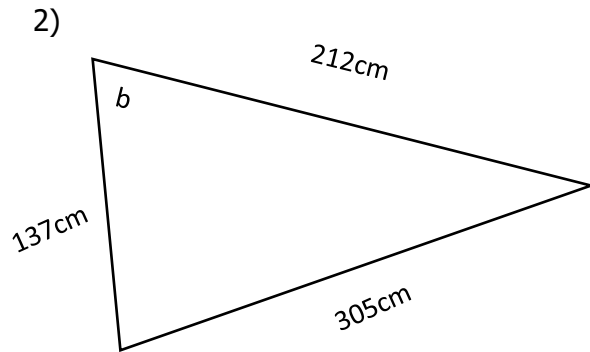


Video 5 – Using the Cosine Rule

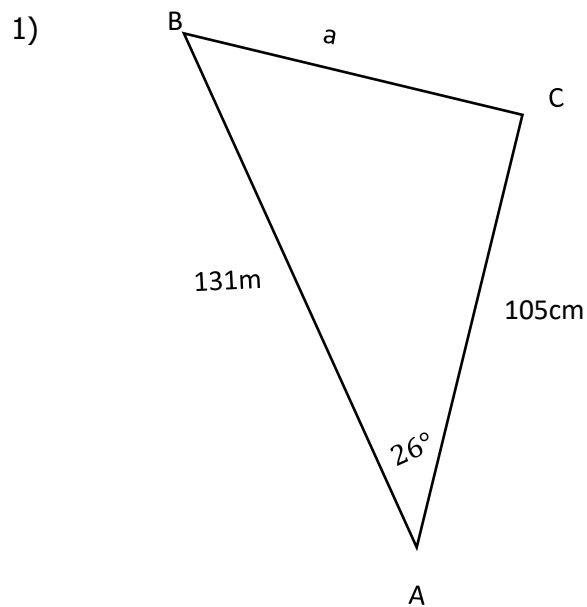


Chapter 11
Triangle Geometry

Transition Piece 1
Task 2b



[Video 6](#) - Find all the missing sides and angles of a triangle

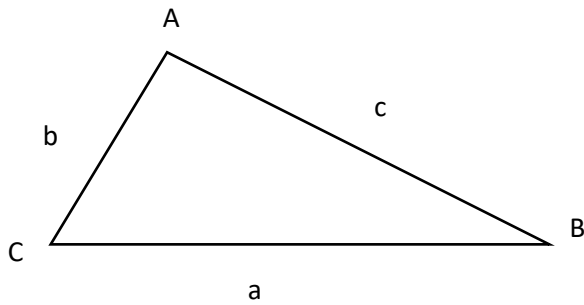


Chapter 11 **Triangle Geometry**

Transition Piece 1 **Task 2b**

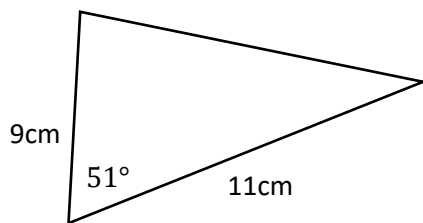
[Video 7](#) - Proof of area of a triangle

1)



[Video 8](#) - Finding the Area of Triangles

1)



2)

