

WSFC Taster Day

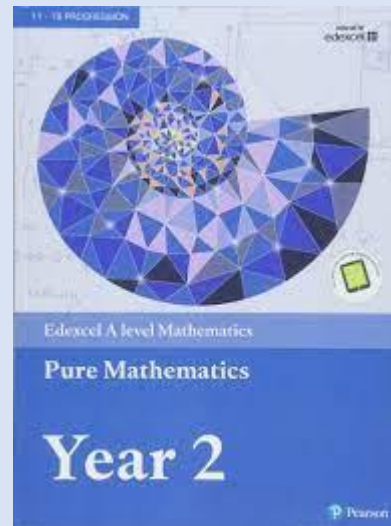
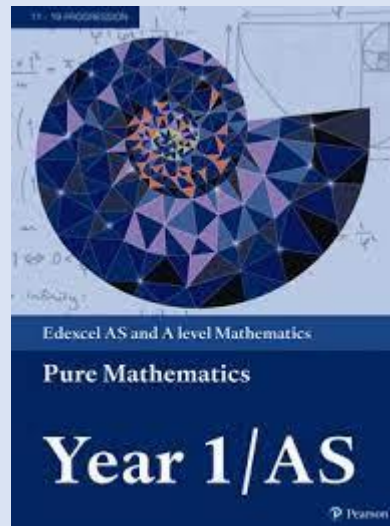
A level Mathematics

Please have cameras and be on mute

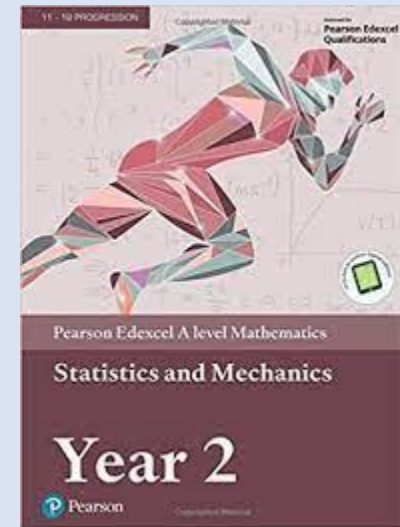
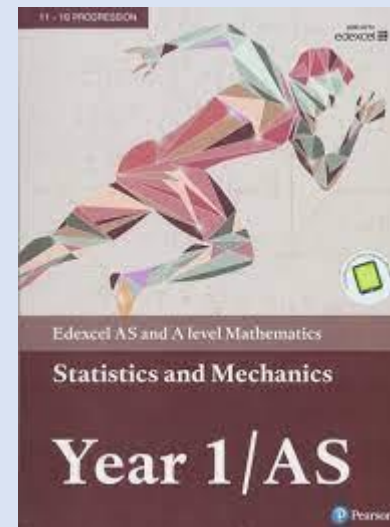
Edexcel A-level Maths

Pure

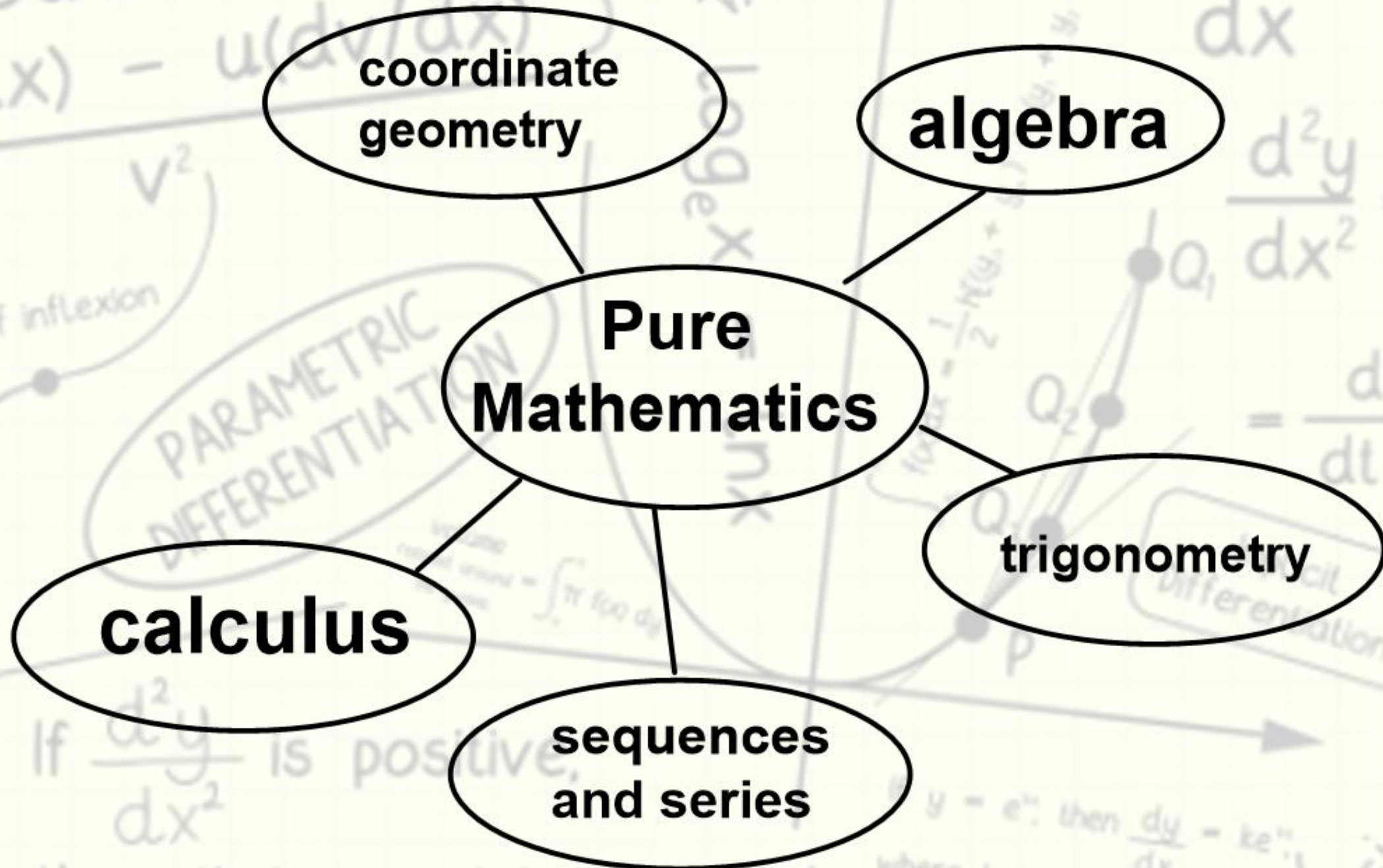
Applied



$\frac{2}{3}$



$\frac{1}{3}$

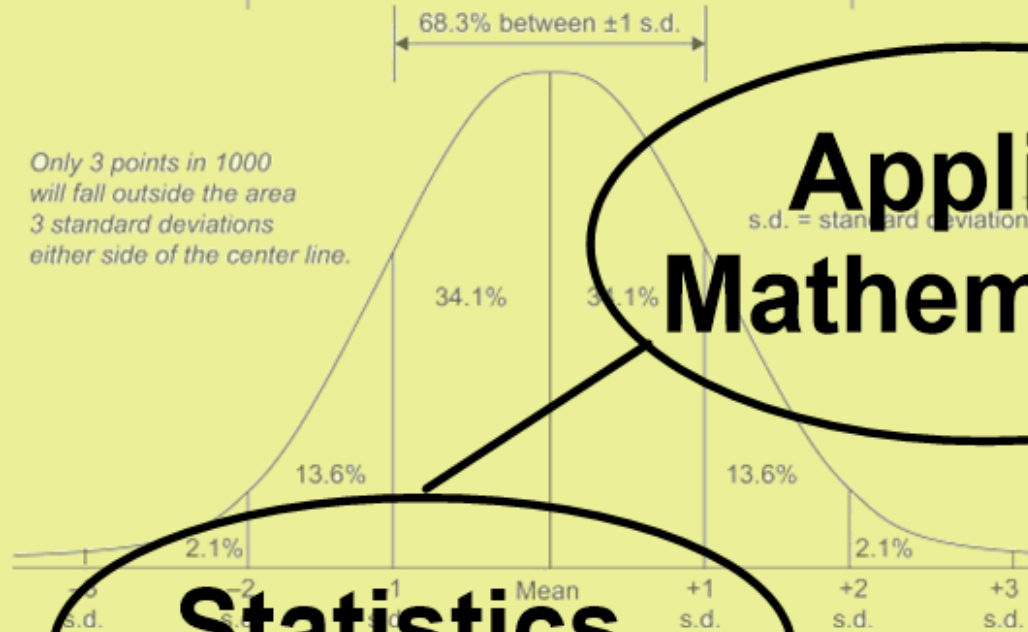


Applied Mathematics

Mechanics

Statistics

Only 3 points in 1000 will fall outside the area 3 standard deviations either side of the center line.



Probability

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$P(A \cap B) = P(A)P(B | A)$$

data

$$P(A | B) = \frac{P(B | A)P(A)}{P(B | A)P(A) + P(B | A')P(A')}$$

probability

$$\text{Bayes' Theorem: } P(A_j | B) = \frac{P(A_j)P(B | A_j)}{\sum P(A_i)P(B | A_i)}$$

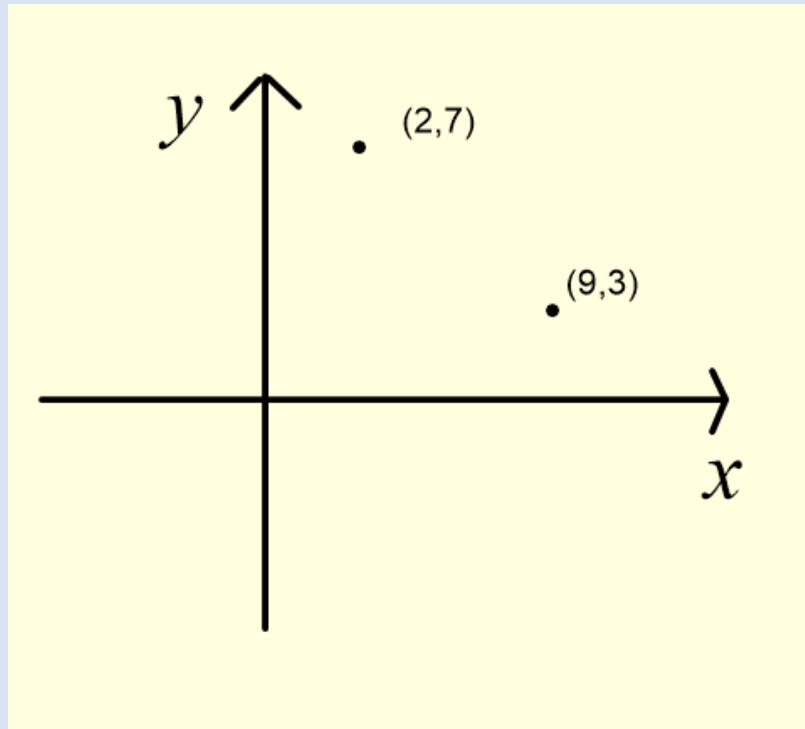
kinematics

statics

First Few Weeks of A-level Maths

Weeks One and Two

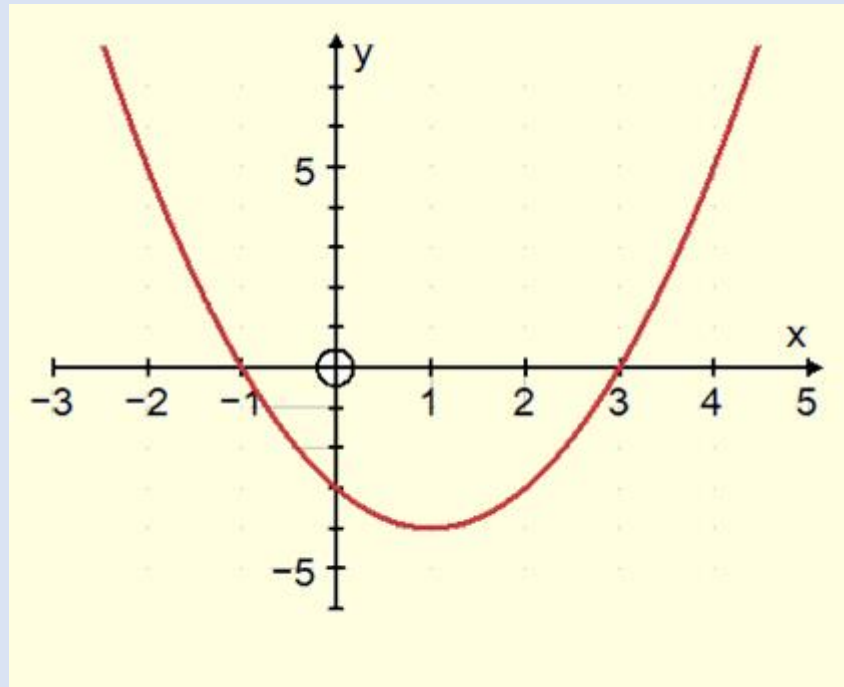
Coordinate
Geometry



First Few Weeks of A-level Maths

Weeks Three and Four

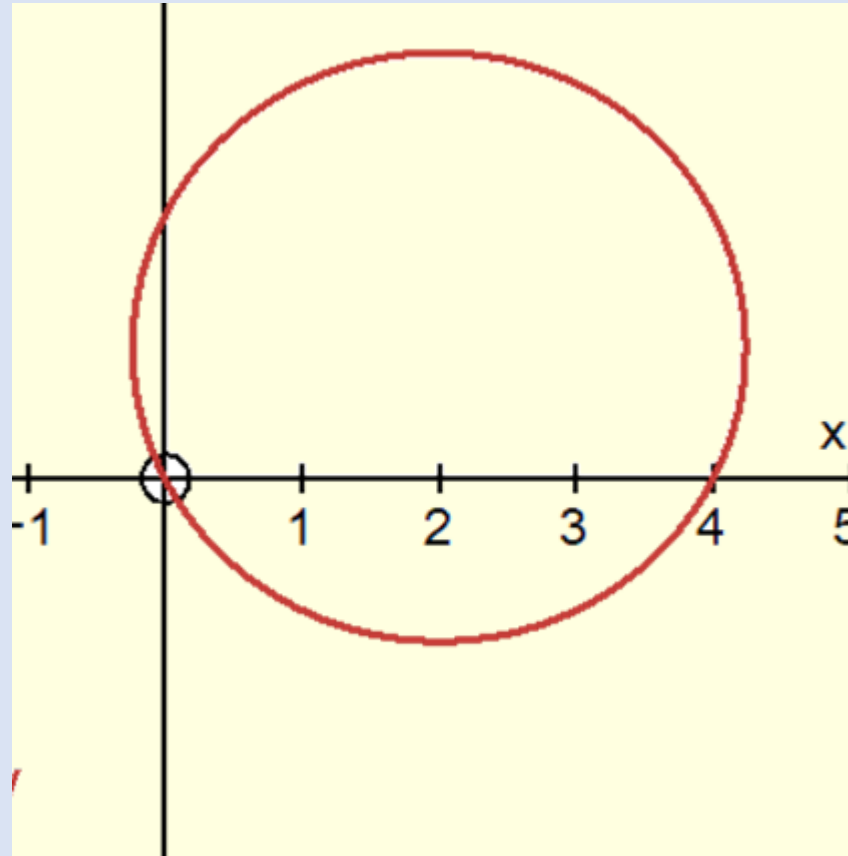
Quadratics



First Few Weeks of A-level Maths

Weeks Five

Circles



The circle C has centre $(3, 1)$ and passes through the point $P(8, 3)$.

(a) Find an equation for C .

(4)

(b) Find an equation for the tangent to C at P , giving your answer in the form

$ax + by + c = 0$, where a , b and c are integers.

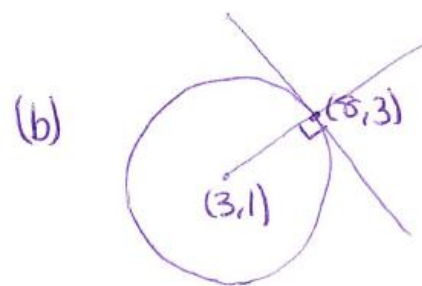
(5)

(Total 9 marks)

(a) Equation of circle $(x-a)^2 + (y-b)^2 = r^2$
Centre $= (3, 1) \Rightarrow (x-3)^2 + (y-1)^2 = r^2$

$(8, 3)$ is on the circle
 $\therefore (8-3)^2 + (3-1)^2 = r^2$
 $\Rightarrow 5^2 + 2^2 = r^2$
 $\Rightarrow r^2 = 29$

$\therefore (x-3)^2 + (y-1)^2 = 29$
is the equation of C



Gradient of radius $= \frac{3-1}{8-3} = \frac{2}{5}$

Gradient of tangent $= -\frac{5}{2}$

Equation of tangent $y - y_1 = m(x - x_1)$
 $y - 3 = -\frac{5}{2}(x - 8)$

$2y - 6 = -5x + 40$

$5x + 2y - 46 = 0$
is the equation of the tangent.

Assessment

Exams at the end of the course (June 2023)

2 x 2 hour exam Pure Maths

1 x 2 hour exam Applied Maths



Why study Maths?

It's challenging and fun.



computer science **biology** **psychology** **physics** **business**
geography **geology** **economics** **chemistry** **environmental science**
engineering

It supports your other subjects

The background of the image is a collage of mathematical concepts. At the top, 'The Quotient Rule' is written in a large, faded font. Below it, 'log_e x = ln x' is visible. To the right, 'Implicit Differentiation' is written inside a rounded rectangle. A graph with several points labeled P, Q1, and Q2 is also present. Other mathematical expressions like 'tan x dx = -ln|cos x| + C' and 'd/dx (u/v) = (v du/dx - u dv/dx) / v^2' are scattered throughout the background.

Why Study Maths?

Degree choices where A-level Mathematics is an essential requirement of nearly all universities

- Actuarial Science
- Aeronautical Engineering
- Chemical Engineering
- Civil Engineering
- Economics
- Electrical/Electronic Engineering
- Engineering (General)
- Mathematics
- Mechanical Engineering
- Physics
- Statistics

Why Study Maths?

Degree Choices where A-level Mathematics is an essential requirement by some, but not all universities

- Accountancy
- Chemistry
- Computer Science
- Management Studies



Why Study Maths?

Degree Choices where A-level Mathematics can make up one of an essential combination of subjects



- Biochemistry – some will say Chemistry plus one from Mathematics/Physics/Biology. Doing Chemistry, Biology and Mathematics or Physics will keep all Biochemistry courses open to you.
- Biomedical Sciences (including Medical Science) – Normally two from Biology, Chemistry, Mathematics and Physics.
- Chemistry – Most courses require Chemistry and would like Mathematics and one other science subject (for example, Physics or Biology).
- Dentistry – Some require Mathematics or Physics.
- Environmental Science/Studies – Many courses will ask for two from Biology, Chemistry, Mathematics, Physics and Geography.
- Geology/Earth Sciences – Usually two from Mathematics, Physics, Chemistry and Biology.
- Materials Science (including Biomedical Materials Science) – Normally two from Chemistry, Mathematics, Physics, Biology (also Design Technology for some universities).
- Medicine – If you do Chemistry, Biology and one from Mathematics or Physics you will keep all the medical schools open to you.
- Optometry (Ophthalmic Optics) – Two from Biology, Chemistry, Mathematics or Physics (some courses prefer Biology as one of the choices).
- Pharmacy – Chemistry and one from Biology, Mathematics and Physics keeps the vast majority of courses open to you. Some courses like to see Chemistry, Biology and Mathematics.
- Physiotherapy – Most courses will consider you with just Biology. However, some also require a second science from Chemistry, Mathematics or Physics.
- Psychology – A few courses ask for one from Biology, Chemistry, Mathematics, Physics.
- Sports Science/Physical Education – Many courses want to see one from Biology/Chemistry/ Mathematics/Physics (some courses will treat Physical Education as a science equivalent).
- Teacher Training – Mathematics can contribute to the list of essential A-levels.
- Veterinary Science – You should do Chemistry and Biology and one from Mathematics/Physics so that you have all universities open to you.

Why Study Maths?

[Which Degree Courses need A-level Mathematics? - Maths Careers](#)

Degree choices where A-level Mathematics is listed as useful by most universities

- Accountancy
- Architecture
- Biochemistry
- Biology
- Biomedical Sciences (including Medical Science)
- Business Studies
- Chemistry
- Computer Science
- Dentistry
- Dietetics
- Geography – Some Geography BSc (science) degrees prefer one from Biology, Chemistry, Mathematics or Physics.
- Law – facilitating subjects at A-level are useful when applying for Law
- Management Studies
- Nursing and Midwifery
- Orthoptics
- Pharmacy
- Philosophy
- Physiotherapy
- Planning
- Psychology
- Surveying
- Teacher Training

Why Study Maths?

[Careerpilot : Jobs by subject](#)

Selection of jobs using the subject Maths

[Accounting technician](#)

[Acoustics consultant](#)

[Actuary](#)

[Aerospace engineer](#)

[Air traffic controller](#)

[Bank manager](#)

[Civil engineer](#)

[Credit controller](#)

[Criminologist](#)

[Cyber intelligence officer](#)

[Data analyst-statistician](#)

[Economist](#)

[Electrical engineer](#)

[Finance officer](#)

[Financial adviser](#)

[Insurance underwriter](#)

[Investment analyst](#)

[Meteorologist](#)

[Research scientist](#)

[Software developer](#)

[Stockbroker](#)

[Tax adviser](#)

A-level maths will help you earn even more

“Graduates with a mathematics A level were earning 7- 10 per cent higher wages in their early thirties compared to those who took A-levels in other subjects, even after controlling for undergraduate and postgraduate degrees.

The Smith Review 2017

About Maths at WSFC

8 specialist maths teachers

4 x 65 minute lessons per week

Workshops

Homework



What do Maths students study after A-level.

Accounting and Finance	Computer Games Programming	Motorsport Engineering
Aeronautical Engineering	Computer Science	Natural Sciences
Aerospace Engineering	Economics	Paramedic Science
Architectural Engineering	Electrical and Electronic Engineering	Pharmacy
Astrophysics	Geography	Philosophy, Politics and Economics (PPE)
Biological Sciences	Law	Physics
Biomedical Engineering	Materials Science and Engineering	Physics and Philosophy
Biomedical Science	Mathematics	Politics and Sociology
Business Economics	Mechanical Engineering	Psychology
Cardiac Physiology (Healthcare Science)	Mechatronics and Robotic Systems	Sport, Physical Education and Coaching Science
Chemistry	Medical Sciences	Textiles
Civil and Railway Engineering	Medicine	Veterinary Medicine
Civil Engineering	Modern Languages (4 years)	Veterinary Nursing

Where do Maths students study after A-level.

Anglia Ruskin University	Loughborough University	University of Manchester
Arts University Bournemouth	Nottingham Trent University	University of Nottingham
Aston University, Birmingham	Nottingham Uni	University of Nottingham
Birmingham City University	Royal Holloway, University of London	University of Portsmouth
Birmingham University	Staffordshire University	University of Sheffield
Bristol, University of the West of England	University of Bath	University of Southampton
Cardiff University	University of Birmingham	University of Warwick
Coventry University	University of Bristol	University of Wolverhampton
Imperial College London	University of Essex	University of Worcester
Keele University	University of Exeter	University of York
Lancaster University	University of Gloucestershire	Warwickshire College Group
London South Bank University	University of Liverpool	

Describe a typical maths student?



There is no typical maths student

Maybe you love maths and want to do a maths degree.

Maybe you want to be a doctor and know maths will be useful for that.

Maybe you don't know what you want to do and know maths A-level will help you keep your options open.

Have you considered Further Maths?

If you want to study mathematics at a Russell Group University then you may need to study Further Maths as well as Maths.

If you want to study Physics, Engineering, Economics or Computer Science at a Russell Group University then you will find studying Further Maths to be an advantage.

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Don't buy a new calculator



Wait until you start college.

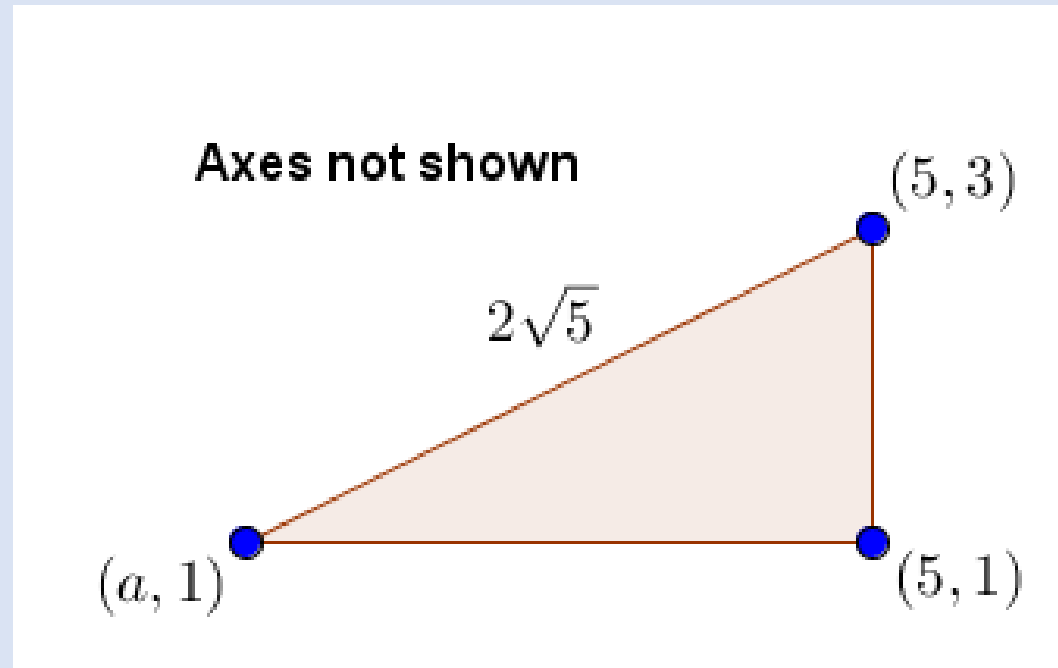
Summer Work

Remember to complete the transition work
and bring it with you first lesson in
September

I am going to show you a problem now.
Work out the answer and type in the chat
BUT DO NOT SEND YET.

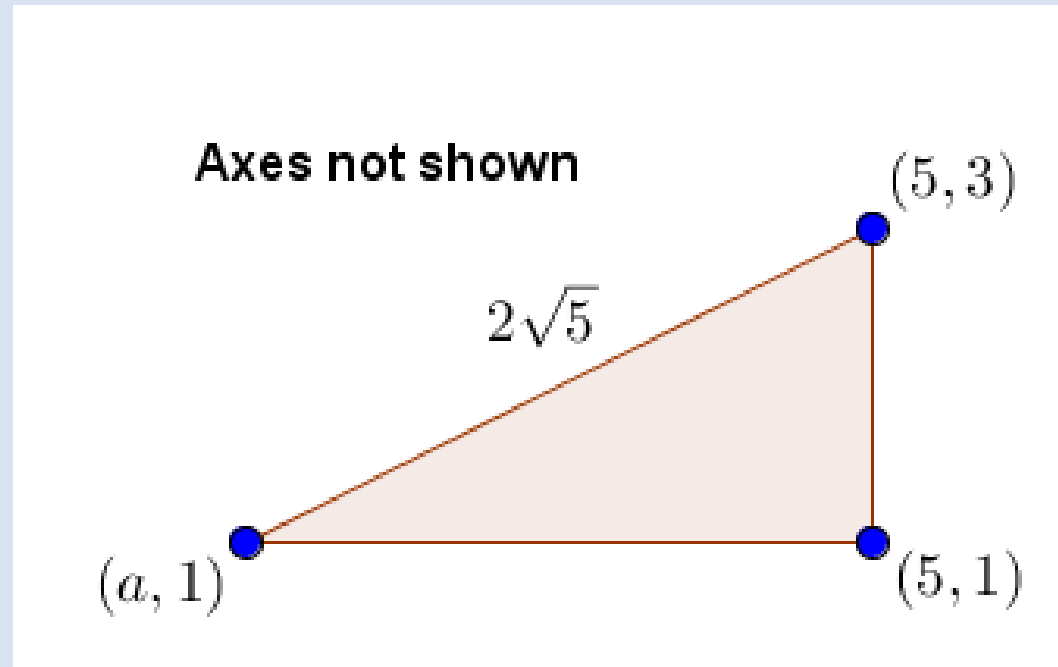
Work out the answer and type
in the chat BUT DO NOT SEND.

What is the value
of a in the
diagram shown?

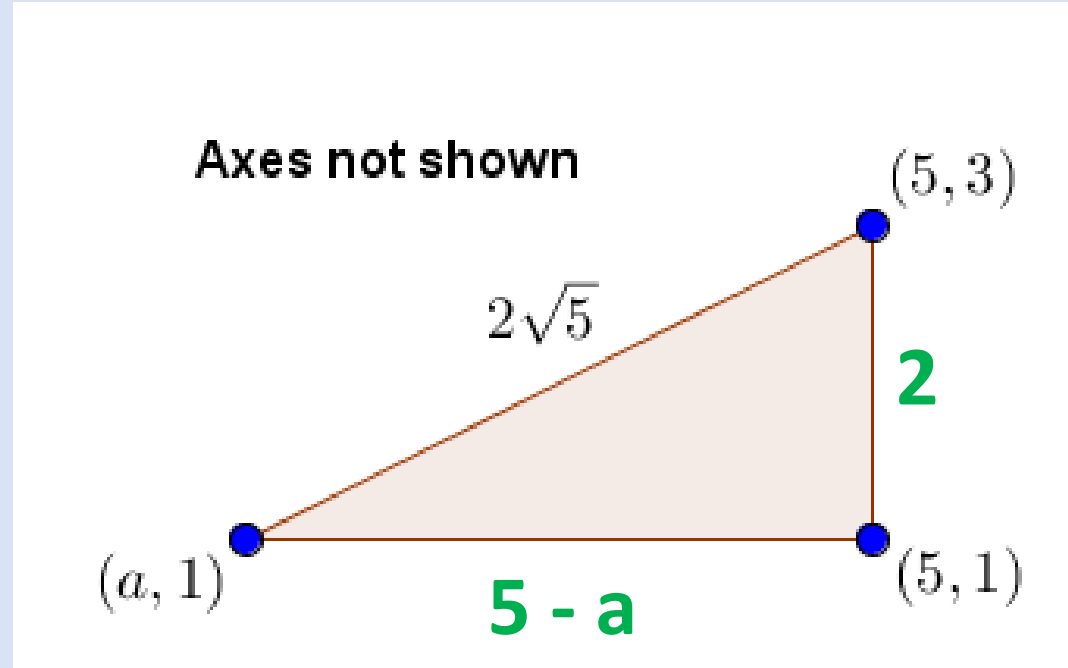


Send me your answer now 😊

What is the value of a in the diagram shown?



What is the value of a in the diagram shown?



Using Pythagoras' Theorem

$$2^2 + (5 - a)^2 = (2\sqrt{5})^2$$

$$4 + 25 - 10a + a^2 = 20$$

$$a^2 - 10a + 9 = 0$$

$$(a - 9)(a - 1) = 0$$

$$a = 9, 1$$

$a = 1$, as a must be less than 5

Questions

Type any questions in the chat and I will try to answer them.

While people are asking questions you might like to try this problem.

All the following statements are true. What is the value of the positive integer n ?

$(\sqrt{2})^n$ is an integer

$(\sqrt[3]{5})^n$ is an integer

$(\sqrt[5]{3})^n$ is an integer

$$1000 < n^2 < 5000$$

Remember to click the
link to your next
session