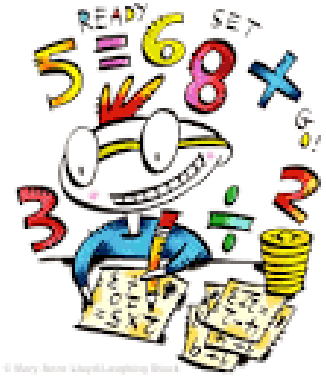
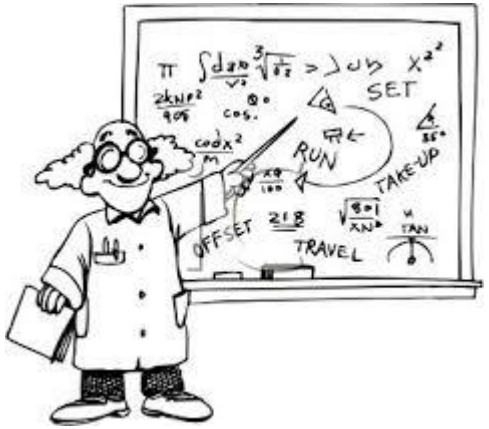


- A Level Mathematics



Why continue with Maths???

Apart from the obvious use of counting the cans of baked beans in your student kitchen, or figuring out how far you can stretch that last £20 of your student loan, maths is a skill which can be applied to so many areas.

If you find *Pi* as easy as...well...pie, and have contemplated studying maths at a higher level

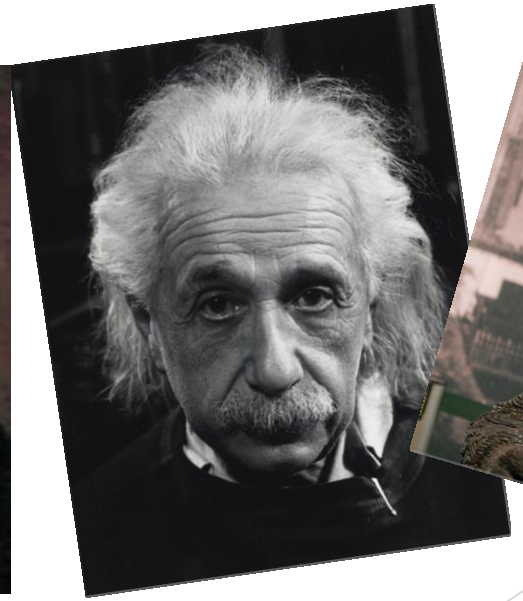
Here are some more reasons……

Humanity needs Mathematicians

Just look around.

Some of civilization's most prized and proud achievements are wholly reliant on Mathematics.






VIDEO

What subjects go with maths?

According to the Russell Group informed choices guide, Maths is a “facilitating” subject which means that it will help you to study lots of other subjects and pursue lots of different careers.

Maths helps supports the study of subjects like physics, chemistry, engineering, IT, economics, business and biology

Studying maths alongside essay-based subjects like English or history can help keep your options open for more jobs and uni courses

What degrees need maths

- Maths A-level is a must have for degrees in: physics, engineering, science, economics and, of course, maths

- Maths is recommended or sometimes required for: computer science, accounting, chemistry, biology and life sciences, medicine/nursing, dentistry, business studies, management studies, finance, architecture, geology, psychology, surveying and even philosophy.

- Some subjects, like medicine, require two out of this common gang of four subjects: maths, physics, chemistry and biology.

Potential for joint courses

Mathematics is a reasonably neutral subject and so it is easily combined with other courses.

Mathematics and History

Mathematics and English

Mathematics and Spanish,

Mathematics and Music

These are but a few of the increasingly broad range of Mathematics based courses available.

A Mathematics degree does not have to be purely numerical, but can involve the arts to offer literary, musical or scientific nourishment.

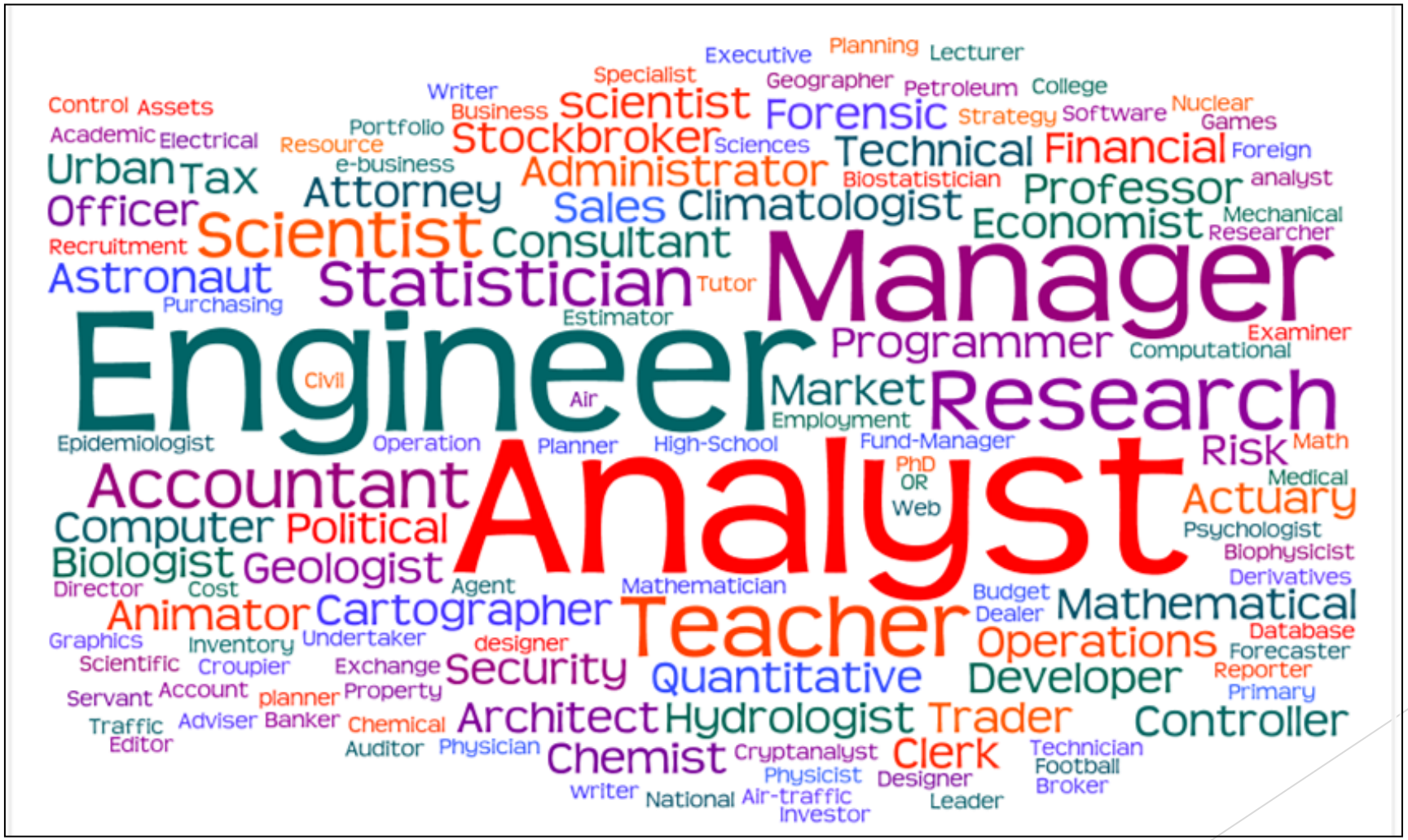
Salary Advantages

Whatever your career ideas, earning potential is always worth considering.

Passing a STEM subject at A Level (Science, Technology, Engineering or Maths) can give you a salary advantage of 15% over those who don't?

So, your A level job prospects are boosted already, whether or not you decide to do a degree

Other career opportunities?



A Level Mathematics at St Francis of Assisi

- Follows the new Edexcel course
- Split into Core and Applied
- Examined by three papers at the end of Year 13
  - Core paper 1: 2 hours and worth 33.33%
  - Core paper 2: 2 hours and worth 33.33%
  - Applied paper: 2 hours and worth 33.33%

Pure Mathematics

- Topic 1 – Proof
- Topic 2 – Algebra and functions
- Topic 3 – Coordinate geometry
- Topic 4: Sequences and Series
- Topic 5: Trigonometry
- Topic 6: Exponentials and logarithms
- Topic 7 Differentiation
- Topic 8: Integration
- Topic 9: Numerical Methods
- Topic 10: Vectors

Applied Mathematics

Statistics

- Topic 1: Statistical sampling
- Topic 2: Data presentation and interpretation
- Topic 3: Probability
- Topic 4: Statistical distributions
- Topic 5: Statistical hypothesis testing

Applied Mathematics

Mechanics

- Topic 6: Quantities and units in mechanics
- Topic 7: Kinematics
- Topic 8: Forces and Newton's laws
- Topic 9: Moments

Last years results

20% of students gained a Grade A*

46.1% of students gained a Grade A*-B

61.5% of students gained a Grade A*-C

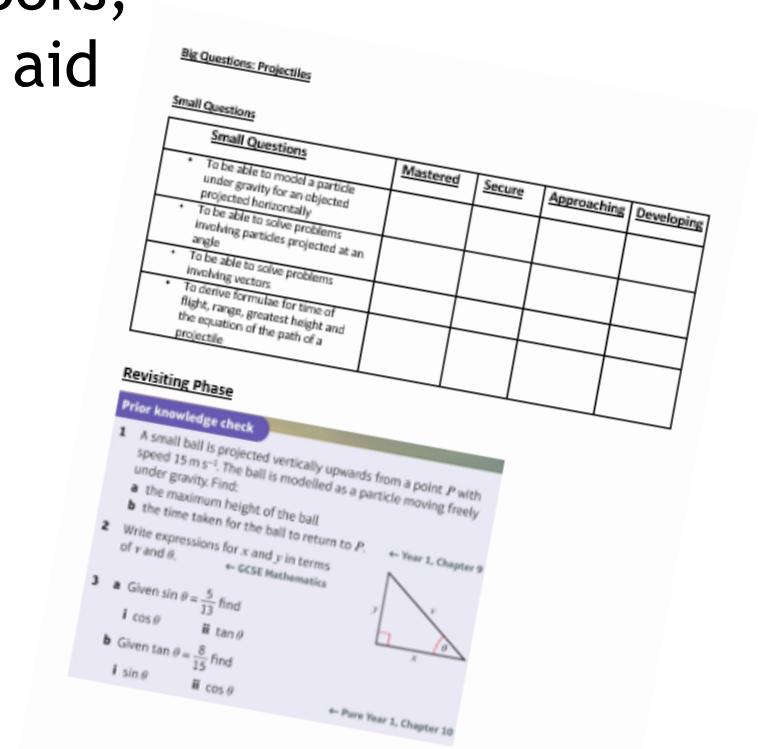
Requirements

To study A Level mathematics you will need a **GOOD** Grade 7

The course is very challenging and you will need to be very confident with the Higher GCSE. Content especially the algebra topics

How is A Level Maths Taught?

Using Knowledge Workbooks, designed to support and aid learning throughout the course.



Big Questions: Projectiles

Small Questions

Small Questions	Mastered	Secure	Approaching	Developing
• To be able to model a particle under gravity for an objected projected horizontally				
• To be able to solve problems involving particles projected at an angle				
• To be able to solve problems involving vectors				
• To derive formulae for time of flight, range, greatest height and the equation of the path of a projectile				

Revisiting Phase

Prior knowledge check

1 A small ball is projected vertically upwards from a point P with speed 15 m s^{-1}. The ball is modelled as a particle moving freely under gravity. Find:
a the maximum height of the ball
b the time taken for the ball to return to P.

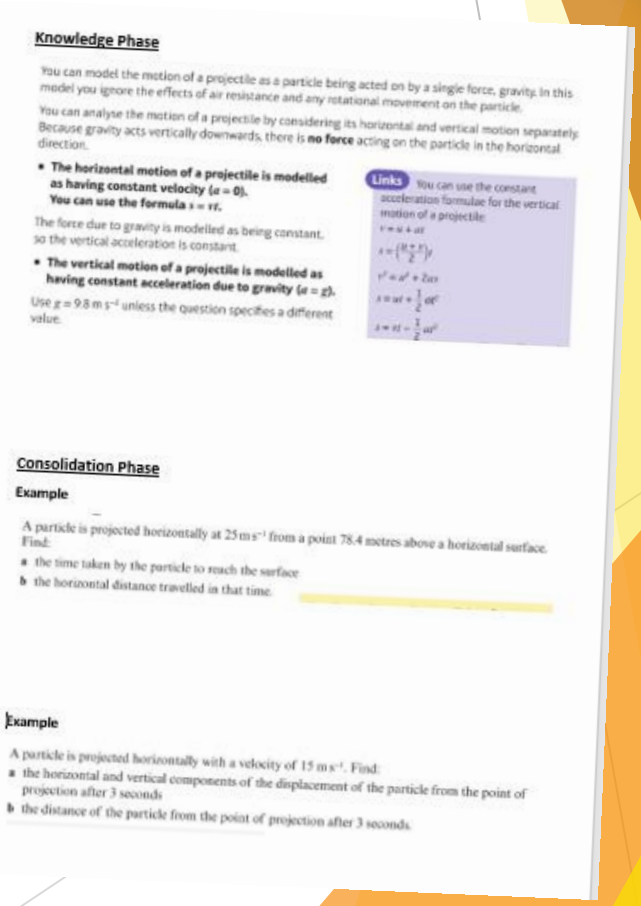
← Year 1, Chapter 9

2 Write expressions for x and y in terms of r and θ.

← GCSE Mathematics

3 a Given $\sin\theta = \frac{5}{13}$ find
i $\cos\theta$ ii $\tan\theta$
b Given $\tan\theta = \frac{8}{15}$ find
i $\sin\theta$ ii $\cos\theta$

← Pure Year 1, Chapter 10



Knowledge Phase

You can model the motion of a projectile as a particle being acted on by a single force, gravity. In this model you ignore the effects of air resistance and any rotational movement on the particle.

You can analyse the motion of a projectile by considering its horizontal and vertical motion separately. Because gravity acts vertically downwards, there is **no force** acting on the particle in the horizontal direction.

- **The horizontal motion of a projectile is modelled as having constant velocity ($a = 0$).**
  You can use the formula $s = vt$.

The force due to gravity is modelled as being constant, so the vertical acceleration is constant.

- **The vertical motion of a projectile is modelled as having constant acceleration due to gravity ($a = g$).**

Use $g = 9.8$ m s^{-2} unless the question specifies a different value.

Links You can use the constant acceleration formulae for the vertical motion of a projectile:

$v = u + at$

$s = \left(\frac{u+v}{2}\right)t$

$v^2 = u^2 + 2as$

$s = ut + \frac{1}{2}at^2$

$s = vt - \frac{1}{2}at^2$

Consolidation Phase

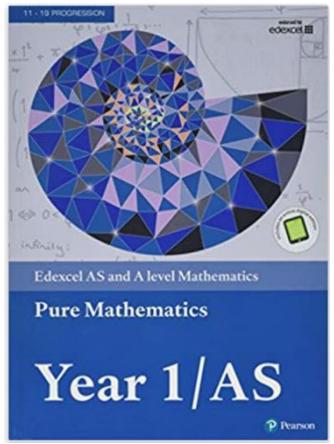
Example

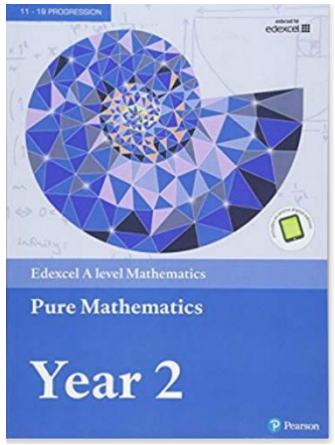
A particle is projected horizontally at 25 m s^{-1} from a point 78.4 metres above a horizontal surface. Find:
a the time taken by the particle to reach the surface
b the horizontal distance travelled in that time.

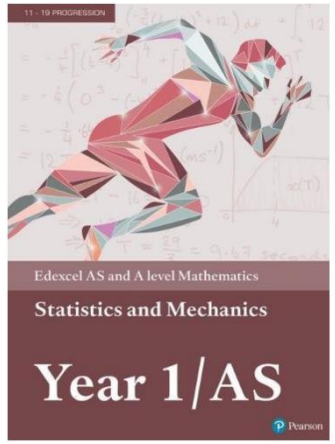
Example

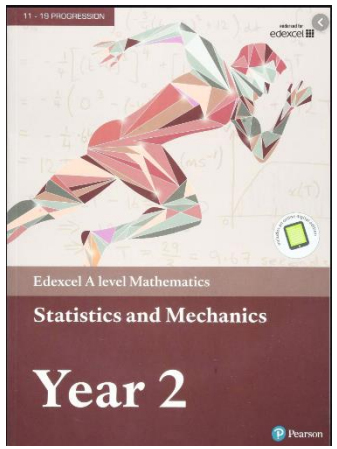
A particle is projected horizontally with a velocity of 15 m s^{-1}. Find:
a the horizontal and vertical components of the displacement of the particle from the point of projection after 3 seconds
b the distance of the particle from the point of projection after 3 seconds.

What you will need









Any Questions?