

Edexcel Physics A-Level

Topic 2.1 - Motion and Quantities

Flashcards

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What must always be true when using the SUVAT equations of motion?



What must always be true when using the SUVAT equations of motion?

The acceleration must be uniform - if the acceleration is changing, the equations are not valid.



What does the gradient of a distance-time graph represent?



What does the gradient of a distance-time graph represent?

Speed



What does the gradient of a displacement-time graph represent?



What does the gradient of a displacement-time graph represent?

Velocity



What does the gradient of a velocity-time graph represent?



What does the gradient of a velocity-time graph represent?

Acceleration.



Describe the shape of a velocity-time graph for an object travelling with uniform acceleration.



Describe the shape of a velocity-time graph for an object travelling with uniform acceleration.

If acceleration is constant, the gradient of the velocity-time graph will be constant and so it will form a straight line graph.



Describe the shape of a velocity-time graph for an object travelling with uniform acceleration.



Describe the shape of a velocity-time graph for an object travelling with non-uniform acceleration.

If acceleration is not constant, the gradient of the velocity-time graph will change and so it will form a curve.



Compare the velocity-time graphs for a uniformly accelerating and a uniformly decelerating object.



Compare the velocity-time graphs for a uniformly accelerating and a uniformly decelerating object.

- For an accelerating object, the gradient will be positive
- For a decelerating object, the gradient will be negative



What is a scalar quantity?



What is a scalar quantity?

A scalar quantity is one that has a magnitude but **not** a fixed direction.



What is a vector quantity?



What is a vector quantity?

A vector quantity is one that has a magnitude **and** a fixed direction.



Give five examples of scalar quantities.



Give five examples of scalar quantities.

1. Distance
2. Speed
3. Mass
4. Energy
5. Temperature



Give five examples of vector quantities.



Give five examples of vector quantities.

1. Displacement
2. Velocity
3. Acceleration
4. Momentum
5. Force



How is a vector quantity represented on a diagram?



How is a vector quantity represented on a diagram?

- As an arrow
- The direction of the arrow represents the direction of the quantity
- The length of the arrow represents the magnitude of the quantity

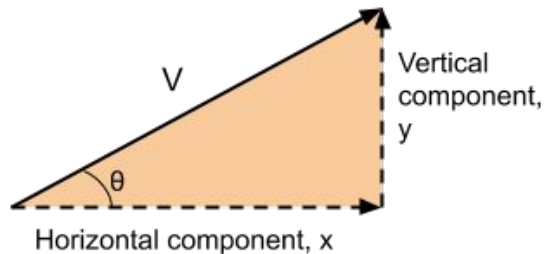


What does resolving a vector involve?

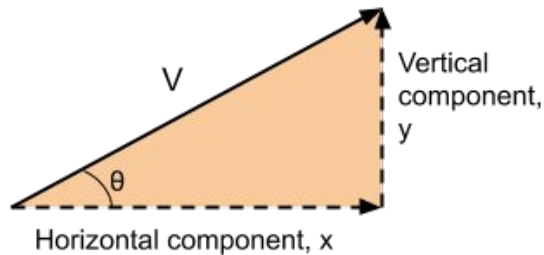


What does resolving a vector involve?

Splitting the vector into two perpendicular components.

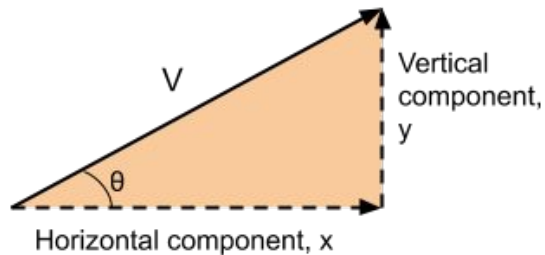


Define the horizontal component of the below vector in terms of V and θ .

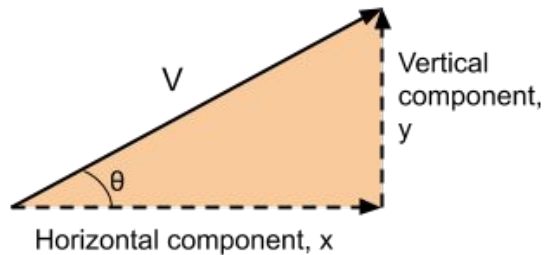


Define the horizontal component of the below vector in terms of V and θ .

$$x = V \cos \theta$$

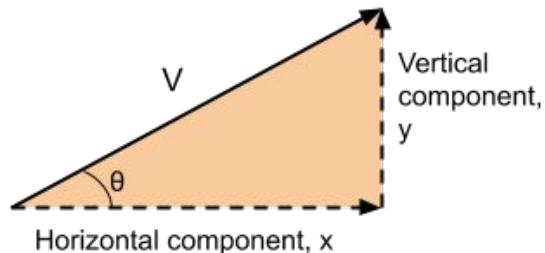


Define the vertical component of the below vector in terms of V and θ .



Define the vertical component of the below vector in terms of V and θ .

$$y = V \sin \theta$$



Describe the relationship between the perpendicular components of a vector.



Describe the relationship between the perpendicular components of a vector.

The perpendicular components are independent of each other.



How should the components of a projectile be handled when carrying out calculations?



How should the components of a projectile be handled when carrying out calculations?

- The horizontal and vertical components are independent of each other and so should be treated separately
- SUVAT should be used separately for each component



If a projectile is moving freely under gravity, what can be said about the vertical acceleration?



If a projectile is moving freely under gravity, what can be said about the vertical acceleration?

The vertical acceleration will be the acceleration due to gravity and so will have a magnitude of 9.81ms^{-1} .

