Kinematics

AP Physics C: Mechanics · Vocabulary in context

Word	Example
kinematics /ˌkɪnɪˈmætɪks/	**Kinematics** describes how things move.
scalar /ˈskeɪlə/	Mass is a **scalar** because it has no direction.
magnitude /ˈmægnɪtjuːd/	The force has a **magnitude** of 20 N. 20 N
vector /ˈvektə/	Velocity is a **vector** because it has a direction.
displacement /dɪˈspleɪsmənt/	After walking 3 km east, your **displacement** is 3 km east. 3 km 3 km
velocity /vəˈlɒsɪti/	The ball's **velocity** is 5 m/s to the left. 5 m/s
acceleration /əkˌseləˈreɪʃn/	The car speeds up quickly, so its **acceleration** is large.
resolve /rɪˈzɒlv/	**Resolve** the force into x- and y-components. x y
components /kəmˈpəʊnənts/	Split the velocity into horizontal and vertical **components**.
unit vectors /ˈjuːnɪt ˈvektəz/	The **unit vectors** i and j point along the x- and y-axes. i j x y
derivatives /dɪˈrɪvətɪvz/	Velocity and acceleration are **derivatives** of position with respect to time.
integrate /ˈɪntɪgreɪt/	**Integrate** acceleration to find velocity.
position /pəˈzɪʃn/	The **position** of the car is its distance from the start.
average velocity /ˈævrɪdʒ vəˈlɒsɪti/	**Average velocity** is displacement divided by time.

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instantaneous velocity /ˌɪnstənˈteɪnɪəs vəˈlɒsɪti/	**Instantaneous velocity** is velocity at one moment.
slope /sləʊp/	A steeper line has a larger **slope**.
tangent line /ˈtændʒənt laɪn/	The **tangent line** touches the curve at one point and has the same slope there.
speedometer	A car's **speedometer** shows instantaneous speed.
inverse operations	Differentiation and integration are **inverse operations**.
kinematic equations	The **kinematic equations** link displacement, velocity, acceleration and time.
free fall /friː fɔːl/	A stone dropped from a bridge is in **free fall**.
air resistance /eə rɪˈzɪstəns/	**Air resistance** slows down a falling leaf.
negligible /ˈneglɪdʒəbl/	For a heavy stone, air resistance is **negligible**.
reference frame /ˈrefrəns freɪm/	A train is a **reference frame** for the people inside it.
vector addition	Relative velocities combine by **vector addition**.
relative motion /ˈrelətɪv ˈməʊʃn/	**Relative motion** depends on who is watching.
independently	Without air resistance, analyse horizontal and vertical motion **independently**.
projectile motion /prəˈdʒektaɪl ˈməʊʃn/	One model of **projectile motion** ignores air resistance.

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parabola /pəˈræbələ/	A thrown ball follows a **parabola**.
axis /ˈæksɪs/	Label each **axis** of the graph.
dot product /dɒt ˈprɒdʌkt/	To find the **dot product**, multiply matching parts and add.
cross product /krɒs ˈprɒdʌkt/	Torque is the **cross product** of r and F. r F
torque /tɔːk/	A longer spanner gives more **torque**.
angular momentum /ˈæŋgjʊlə məʊˈmentəm/	A spinning ice skater has **angular momentum**.

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