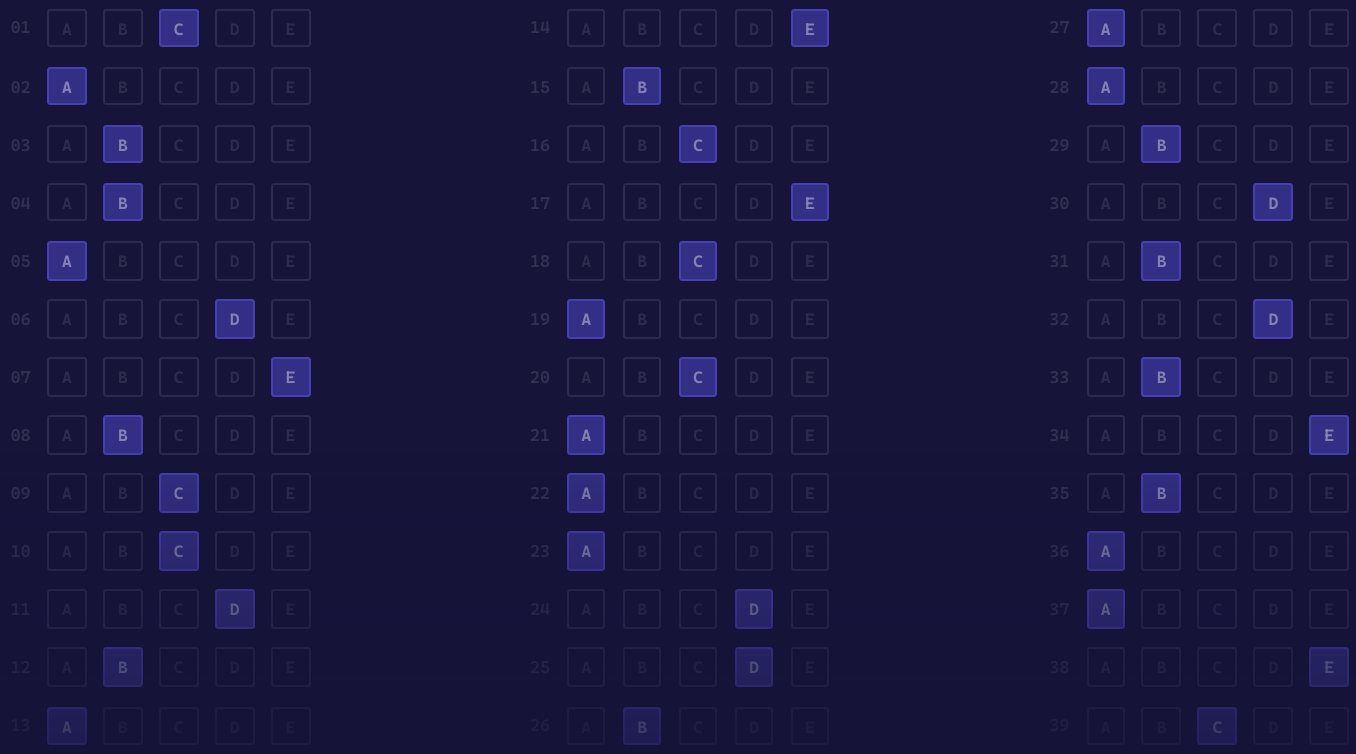
MOMETRIX
SMARTER PREP. BETTER RESULTS.



PRACTICE QUESTIONS

College Board AP - United Kingdom

APPH1

AP Physics 1: Algebra-Based

EDITION	QUESTIONS	FORMAT
Demo	9	Limited Edition PDF

WEB www.mometrix.net

SUPPORT support@mometrix.net

Before you begin

What this is

9 practice questions for College Board AP - United Kingdom `APPH1`, each with its answer key and an explanation. Answer a question before you read its key — the explanation is worth more once you have committed.

If something looks wrong

Send us three things and we will check it:

- the exam code, `APPH1`
- the question number
- the email address on your order

Write to **support@mometrix.net**. We reply within one business day.

QUESTION 1 MULTIPLE CHOICE

A uniform meterstick has its pivot at the 50.0 cm mark. A 2.0 N force acts upward at the 20.0 cm mark and another force acts downward at the 80.0 cm mark. The meterstick remains in rotational equilibrium. What is the magnitude of the second force? (Choose two.)

A **The first force produces a counterclockwise torque.**

B The second force must act downward with a magnitude of 1.0 N.

C The second force must act downward with a magnitude of 2.0 N.

D **The torque from the second force is clockwise.**

ANSWER **A · D**

WHY The first force acts 30.0 cm to the left of the pivot and upward, producing a counterclockwise torque. For equilibrium, the second force must act 30.0 cm to the right of the pivot and downward, producing an equal clockwise torque. Because the lever arms are equal, the forces must also have equal magnitudes of 2.0 N.

QUESTION 2 MULTIPLE CHOICE

A block attached to an ideal spring oscillates with simple harmonic motion on a frictionless horizontal surface. Which statements are true? (Choose two.)

A **The acceleration has its maximum magnitude at the endpoints of the motion.**

B **The kinetic energy is greatest at equilibrium.**

C The speed is constant throughout the motion.

D The acceleration is zero at the endpoints.

ANSWER **A · B**

WHY In simple harmonic motion, acceleration is proportional to and opposite the displacement, so it is largest in magnitude at the endpoints. The block's speed and kinetic energy are greatest as it passes through equilibrium. Acceleration is zero at equilibrium, not at the endpoints.

QUESTION 3 SINGLE CHOICE

A displacement has components 3.0 m east and 4.0 m north. What is the magnitude of the displacement?

A 1.0 m

B 5.0 m

C 7.0 m

D 12.0 m

ANSWER B

WHY The components are perpendicular, so the magnitude is the square root of the sum of their squares: $\sqrt{(3.0^2 + 4.0^2)} = 5.0$ m.

QUESTION 4 SINGLE CHOICE

A person stands on Earth. According to Newton's third law, the force that the person exerts on Earth is equal in magnitude to which force?

A The force Earth exerts on the person

B The person's weight plus the person's mass

C The normal force exerted by Earth on the person

D The gravitational force exerted by the Sun on the person

ANSWER A

WHY Newton's third law describes the interaction between the person and Earth as an action-reaction pair. Therefore, the person exerts a force on Earth equal in magnitude and opposite in direction to the force Earth exerts on the person.

QUESTION 5 SINGLE CHOICE

A textbook rests on a table without moving. Which statement best describes the forces acting on the textbook?

A The table's normal force on the textbook is greater than Earth's gravitational force on the textbook.

B The table's normal force on the textbook is less than Earth's gravitational force on the textbook.

C The table's normal force on the textbook equals Earth's gravitational force on the textbook.

D No gravitational force acts on the textbook because it is not falling.

ANSWER C

WHY Because the textbook has zero vertical acceleration, the net vertical force is zero. The upward normal force equals the downward gravitational force in magnitude.

QUESTION 6 SINGLE CHOICE

Two objects of equal mass move directly toward each other on a frictionless surface. Object 1 has velocity +4 m/s, and object 2 has velocity -2 m/s. After they collide and stick together, what is their velocity immediately after the collision?

A -1 m/s

B +1 m/s

C +2 m/s

D +3 m/s

ANSWER B

WHY For a perfectly inelastic collision, conservation of momentum gives v = (m(4) + m(-2))/(2m) = +1 m/s. The positive sign indicates motion in the original direction assigned as positive.

QUESTION 7 SINGLE CHOICE

A solid disk and a ring have the same mass and radius. Both rotate about axes through their centers perpendicular to their planes. Which object has the greater moment of inertia?

A The solid disk

B The ring

C They have the same moment of inertia because their masses and radii are equal

D The object with the greater angular speed

ANSWER B

WHY The ring's mass is concentrated farther from the rotation axis, so it has the greater moment of inertia. For the stated mass and radius, a ring's moment of inertia is greater than that of a solid disk. Moment of inertia is independent of angular speed.

QUESTION 8 SINGLE CHOICE

An isolated system consists of objects whose total angular momentum is constant. What must be true of the net external torque acting on the system?

A It is zero.

B It is constant but nonzero.

C It points in the same direction as the angular momentum.

D It increases with time.

ANSWER A

WHY The rate of change of angular momentum equals the net external torque. If the total angular momentum of an isolated system is constant, the net external torque must be zero.

QUESTION 9 SINGLE CHOICE

Two point charges attract each other. Which change could increase the magnitude of the electrostatic force between them?

A Moving them farther apart

B Increasing the magnitude of one charge

C Changing both signs without changing their magnitudes

D Replacing the charges with a conducting material

ANSWER **B**

WHY By Coulomb's law, the force magnitude is proportional to the product of the charge magnitudes and inversely proportional to the square of their separation. Increasing the magnitude of one charge increases that product and therefore increases the force.