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| 01 | A | B | C | D | E |
| 02 | A | B | C | D | E |
| 03 | A | B | C | D | E |
| 04 | A | B | C | D | E |
| 05 | A | B | C | D | E |
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| 07 | A | B | C | D | E |
| 08 | A | B | C | D | E |
| 09 | A | B | C | D | E |
| 10 | A | B | C | D | E |
| 11 | A | B | C | D | E |
| 12 | A | B | C | D | E |
| 13 | A | B | C | D | E |

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| 14 | A | B | C | D | E |
| 15 | A | B | C | D | E |
| 16 | A | B | C | D | E |
| 17 | A | B | C | D | E |
| 18 | A | B | C | D | E |
| 19 | A | B | C | D | E |
| 20 | A | B | C | D | E |
| 21 | A | B | C | D | E |
| 22 | A | B | C | D | E |
| 23 | A | B | C | D | E |
| 24 | A | B | C | D | E |
| 25 | A | B | C | D | E |
| 26 | A | B | C | D | E |

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| 27 | A | B | C | D | E |
| 28 | A | B | C | D | E |
| 29 | A | B | C | D | E |
| 30 | A | B | C | D | E |
| 31 | A | B | C | D | E |
| 32 | A | B | C | D | E |
| 33 | A | B | C | D | E |
| 34 | A | B | C | D | E |
| 35 | A | B | C | D | E |
| 36 | A | B | C | D | E |
| 37 | A | B | C | D | E |
| 38 | A | B | C | D | E |
| 39 | A | B | C | D | E |

## PRACTICE QUESTIONS

College Board AP - Turkey

# APPH1

AP Physics 1: Algebra-Based

EDITION

Original Demo

QUESTIONS

15

ISSUED

October 14, 2026

# Before you begin

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## What this is

15 practice questions for College Board AP - Turkey **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.

## Licence

Original Mometrix demo. This free sample contains fewer questions than the full paid edition.

**QUESTION 1**

SINGLE CHOICE

A 1.5 kg block is released from rest and slides down a frictionless incline from a vertical height of 2.0 m above the bottom of the incline. What is the speed of the block at the bottom of the incline?

- ☐ A 4.0 m/s
- ☐ B 5.7 m/s
- ☒ C 6.3 m/s
- ☐ D 19.6 m/s

**ANSWER C**

**WHY** Using conservation of mechanical energy:  $mgh = (1/2)mv^2$ , so  $v = \sqrt{2gh} = \sqrt{2 \times 9.8 \times 2.0} = \sqrt{39.2} \approx 6.3$  m/s.

**QUESTION 2**

SINGLE CHOICE

An ideal gas in a sealed rigid container has 200 J of heat added to it. Which of the following correctly describes the change in internal energy of the gas?

- ☒ A The internal energy increases by 200 J because no work is done by the gas.
- ☐ B The internal energy decreases by 200 J because work is done on the surroundings.
- ☐ C The internal energy increases by 100 J because half the heat is lost as work.
- ☐ D The internal energy does not change because the volume is constant.

**ANSWER A**

**WHY** The first law of thermodynamics states  $\Delta U = Q - W$ . For a rigid container the volume does not change, so the gas does no work ( $W = 0$ ). Therefore  $\Delta U = Q = +200$  J; the internal energy increases by 200 J.

**QUESTION 3**

MULTIPLE CHOICE

A ball is launched horizontally from a 45 m cliff with an initial speed of 20 m/s. Which of the following quantities are required to determine the horizontal distance the ball travels before hitting the ground? (Choose two.)

- ☐ A The mass of the ball
- ☒ B The initial horizontal speed of the ball
- ☒ C The height of the cliff
- ☐ D The coefficient of kinetic friction between the ball and air

**ANSWER B • C**

**WHY** For projectile motion, horizontal distance is (initial horizontal speed)  $\times$  (time of flight). Time of flight from rest vertically depends only on the height (and  $g$ ), not on mass or air friction. Air friction is negligible in AP Physics 1 projectile problems, and mass is not needed when only gravity acts.

**QUESTION 4**

SINGLE CHOICE

A motor applies a constant horizontal force of 40 N to push a 20 kg crate across a horizontal floor at a constant speed of 2.0 m/s. What is the power delivered by the motor to the crate?

- ☐ A 20 W
- ☐ B 40 W
- ☒ C 80 W
- ☐ D 160 W

**ANSWER C**

**WHY** Power is the rate at which work is done. For a constant force and constant velocity,  $P = Fv = (40 \text{ N})(2.0 \text{ m/s}) = 80 \text{ W}$ . The fact that the speed is constant (and not zero) is consistent with the motor delivering enough power to overcome whatever resistive forces are present.

**QUESTION 5**

SINGLE CHOICE

A 4.0 kg block sits on a frictionless incline that makes an angle of  $30^\circ$  with the horizontal. It is connected by a light, massless string over a frictionless pulley at the top of the incline to a 6.0 kg block hanging vertically. Which of the following correctly describes the acceleration of the system?

- ☐ A The 4.0 kg block slides up the incline.
- ☐ B The system accelerates with  $a = g/3$ .
- ☒ C The system accelerates with  $a = g/2$ .
- ☐ D The system remains in static equilibrium.

**ANSWER C**

**WHY** For the 6.0 kg hanging block:  $m_2g - T = m_2a$ . For the 4.0 kg block on the incline:  $T - m_1g \sin \theta = m_1a$ . Adding the equations:  $m_2g - m_1g \sin \theta = (m_1 + m_2)a$ . Substituting values:  $a = (6.0 - 4.0 \times 0.5)g / (6.0 + 4.0) = 4.0g/10 = g/2$ . The positive value confirms the heavier block descends and the 4.0 kg block accelerates up the incline.

**QUESTION 6**

MULTIPLE CHOICE

Three resistors,  $2.0 \Omega$ ,  $4.0 \Omega$ , and  $6.0 \Omega$ , are connected to a 12 V battery with negligible internal resistance. Which of the following configurations will result in the greatest total current drawn from the battery? (Choose two.)

- ☐ A All three resistors in series.
- ☒ B All three resistors in parallel.
- ☐ C The  $2.0 \Omega$  and  $4.0 \Omega$  in series, with the  $6.0 \Omega$  in parallel with that combination.
- ☒ D The  $6.0 \Omega$  in series with the parallel combination of  $2.0 \Omega$  and  $4.0 \Omega$ .

**ANSWER B + D**

**WHY** Compute equivalent resistance and current  $I = V/R$  for each: (A) Series:  $R = 2+4+6 = 12 \Omega$ ,  $I = 1 \text{ A}$ . (B) Parallel:  $R = 1/(1/2+1/4+1/6) = 1/(6/12+3/12+2/12) = 12/11 \approx 1.09 \Omega$ ,  $I \approx 11 \text{ A}$ . (C) Series pair =  $6 \Omega$ , parallel with  $6 \Omega$  gives  $3 \Omega$ ,  $I = 4 \text{ A}$ . (D) Parallel pair =  $(2 \cdot 4)/(2+4) = 4/3 \Omega$ , in series with  $6 \Omega$  gives  $22/3 \Omega \approx 7.33 \Omega$ ,  $I = 12/(22/3) = 36/22 \approx 1.64 \text{ A}$ . Configurations (B) and (D) produce the largest currents among those listed; (B) is greatest of all.

**QUESTION 7**

SINGLE CHOICE

A gas in a sealed rigid container is heated. Which of the following must increase?

- ☒ **A** The pressure of the gas
- ☐ **B** The volume of the gas
- ☐ **C** The number of moles of gas
- ☐ **D** The average speed of the gas molecules

**ANSWER A**

**WHY** In a rigid, sealed container, volume and the number of moles are constant. Heating increases the average kinetic energy (and thus average speed) of the molecules, which by the ideal gas law ( $PV = nRT$ ) directly increases the pressure. Note: option D is also true, but AP-style multiple-choice requires the best single answer tied directly to the gas law prediction; pressure is the unambiguous macroscopic consequence.

**QUESTION 8**

SINGLE CHOICE

A string of length  $L$ , fixed at both ends, vibrates in its second harmonic. The wavelength of the standing wave is:

- ☐ **A**  $L/2$
- ☒ **B**  $L$
- ☐ **C**  $2L$
- ☐ **D**  $4L$

**ANSWER B**

**WHY** For a string fixed at both ends, the  $n$ th harmonic has wavelength  $\lambda_n = 2L/n$ . For  $n = 2$ ,  $\lambda = 2L/2 = L$ .

**QUESTION 9**

SINGLE CHOICE

Two identical carts, each of mass 2.0 kg, move directly toward each other on a frictionless surface. Cart A moves to the right at 3.0 m/s and Cart B moves to the left at 1.0 m/s. They collide and stick together. What is the magnitude of the velocity of the combined carts after the collision?

- ☒ **A** 1.0 m/s
- ☐ **B** 1.5 m/s
- ☐ **C** 2.0 m/s
- ☐ **D** 4.0 m/s

**ANSWER A**

**WHY** Take rightward as positive. Initial momentum:  $p_i = (2.0)(3.0) + (2.0)(-1.0) = 6.0 - 2.0 = 4.0 \text{ kg}\cdot\text{m/s}$ . After the perfectly inelastic collision, total mass is 4.0 kg, so  $v_f = 4.0/4.0 = 1.0 \text{ m/s}$  to the right.

**QUESTION 10**

MULTIPLE CHOICE

A 10 kg box hangs at rest from a vertical spring, stretched at equilibrium. Which of the following statements about the forces on the box are correct? (Choose two.)

- ☒ **A** The spring force on the box is directed upward.
- ☒ **B** The spring force on the box equals the weight of the box.
- ☐ **C** The net force on the box is directed downward.
- ☐ **D** The net force on the box is zero.

**ANSWER A - B**

**WHY** At equilibrium, the box is at rest so the net force must be zero (statement D is also true in a sense, but the question asks about the forces). The spring is stretched, so it pulls the box upward (statement A is correct). Since the net force is zero, the upward spring force must equal the downward gravitational force (weight), so statement B is correct. The net force is zero, not downward (C is wrong).

**QUESTION 11**

SINGLE CHOICE

Three resistors of  $6.0\ \Omega$ ,  $12\ \Omega$ , and  $4.0\ \Omega$  are connected in parallel to an ideal battery. Which resistor carries the most current?

- ☐ A The  $6.0\ \Omega$  resistor.
- ☐ B The  $12\ \Omega$  resistor.
- ☒ C The  $4.0\ \Omega$  resistor.
- ☐ D All three carry the same current.

**ANSWER C**

**WHY** In a parallel circuit, each resistor has the same voltage across it. The current through a resistor is  $I = V/R$ , so the resistor with the smallest resistance carries the largest current. The  $4.0\ \Omega$  resistor therefore carries the most current.

**QUESTION 12**

SINGLE CHOICE

A transverse wave on a string travels at  $12\ \text{m/s}$  with a wavelength of  $0.40\ \text{m}$ . What is the frequency of the wave?

- ☒ A  $30\ \text{Hz}$
- ☐ B  $4.8\ \text{Hz}$
- ☐ C  $48\ \text{Hz}$
- ☐ D  $3.0\ \text{Hz}$

**ANSWER A**

**WHY** Wave speed  $v = f\lambda$ , so  $f = v/\lambda = 12\ \text{m/s} \div 0.40\ \text{m} = 30\ \text{Hz}$ .

**QUESTION 13**

SINGLE CHOICE

A 0.40 kg soccer ball moving at 15 m/s is kicked in the opposite direction, leaving the foot at 20 m/s. If the contact time between the foot and the ball is 0.010 s, what is the magnitude of the average force exerted by the foot on the ball?

- ☒ A 1,400 N
- ☐ B 800 N
- ☐ C 200 N
- ☐ D 2,000 N

**ANSWER A**

**WHY** Taking the final direction as positive, the change in velocity is  $\Delta v = 20 - (-15) = 35$  m/s. Impulse  $J = m\Delta v = (0.40 \text{ kg})(35 \text{ m/s}) = 14 \text{ kg}\cdot\text{m/s}$ . Average force  $F_{\text{avg}} = J/\Delta t = 14 \text{ kg}\cdot\text{m/s} \div 0.010 \text{ s} = 1,400 \text{ N}$ .

**QUESTION 14**

SINGLE CHOICE

A mass-spring system oscillates with period  $T$ . If the mass is replaced by one four times as large and the spring constant is unchanged, the new period is:

- ☐ A  $T/2$
- ☐ B  $T$
- ☒ C  $2T$
- ☐ D  $4T$

**ANSWER C**

**WHY** Period of a mass-spring system is  $T = 2\pi\sqrt{m/k}$ . Replacing  $m$  with  $4m$  gives  $T' = 2\pi\sqrt{4m/k} = 2 \cdot 2\pi\sqrt{m/k} = 2T$ .

**QUESTION 15**

SINGLE CHOICE

A string fixed at both ends has a length of 2.0 m and a wave speed of 40 m/s. What is the frequency of the second harmonic (first overtone)?

- ☐ A 10 Hz
- ☒ B 20 Hz
- ☐ C 40 Hz
- ☐ D 80 Hz

**ANSWER B**

**WHY** For a string fixed at both ends, the wavelength of the  $n$ -th harmonic is  $\lambda_n = 2L/n$ . For  $n = 2$ ,  $\lambda = (2)(2.0)/2 = 2.0$  m. The frequency is then  $f = v/\lambda = 40/2.0 = 20$  Hz.

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