ALBERTA PHYSICS 20 · FINAL EXAM · 50 QUESTIONS

Final Exam — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **A car travels 240 m in 12 s at a constant speed. The speed of the car is**

- A 0.050 m/s
- B 20 m/s
- C 2.0 m/s
- D 2880 m/s

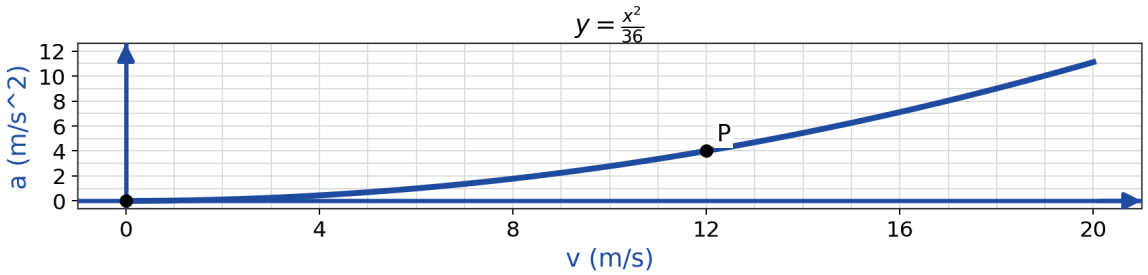
Understand It with Pulse | Flag a mistake

2 **The weight of a 12 kg mass on Earth, where g = 9.81 m/s², is**

- A 118 N
- B 12 N
- C 1.22 N
- D 1.18×10^3 N

Understand It with Pulse | Flag a mistake

3 **The graph shows centripetal acceleration against speed for a car on a flat curve. The centripetal acceleration of the car when its speed is 12 m/s, in m/s² to the nearest tenth, is _____**



ANSWER _____

Understand It with Pulse | Flag a mistake

4 **A pendulum swings back and forth with a period of 0.50 s. The frequency of the pendulum is**

A 0.50 Hz

B 5.0 Hz

C 2.0 Hz

D 0.20 Hz

Understand It with Pulse | Flag a mistake

5 **Two cars on a straight road are 300 m apart and drive directly toward each other, one at 20 m/s and the other at 25 m/s, both at constant speeds. The time until the cars meet is**

- A 12 s
- B 15 s
- C 3.8 s
- D 6.7 s

Understand It with Pulse | Flag a mistake

6 **A crate slides across a rough horizontal floor. The force of kinetic friction acting on the crate is directed**

- A perpendicular to the floor
- B in the same direction as the motion
- C opposite to the direction of motion
- D in the direction of the applied force

Understand It with Pulse | Flag a mistake

7 **An object moving in a circle completes 20 revolutions in 8.0 s. The frequency of the motion is**

- **A** 2.5 Hz
- **B** 0.40 Hz
- **C** 12 Hz
- **D** 160 Hz

Understand It with Pulse | Flag a mistake

8 **A 0.20 kg mass attached to a spring oscillates on a frictionless horizontal surface. The spring constant is 50 N/m. Using $T = 2\pi\sqrt{\frac{m}{k}}$, the period of oscillation is**

- **A** 0.40 s
- **B** 0.63 s
- **C** 1.6 s
- **D** 2.5 s

Understand It with Pulse | Flag a mistake

9 **An object is dropped from rest from a tall building. Use g = 9.81 m/s² and ignore air resistance. The speed of the object after 3.0 s is**

A 29 m/s

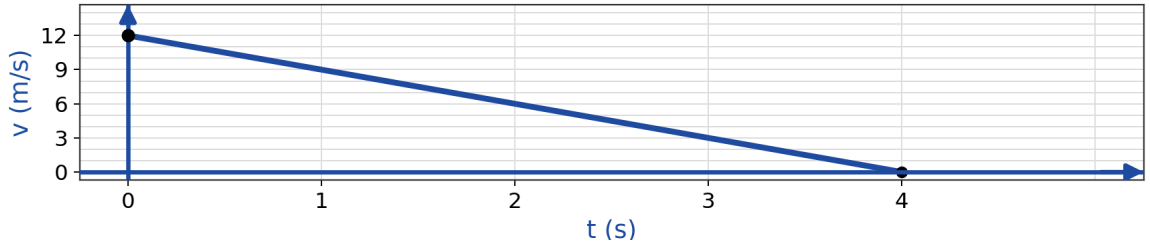
B 3.3 m/s

C 44 m/s

D 88 m/s

Understand It with Pulse | Flag a mistake

10 **The velocity-time graph shows an 8.0 kg box sliding across a floor and slowing under kinetic friction alone. The magnitude of the force of kinetic friction acting on the box is**



A 24 N

B 96 N

C 32 N

D 12 N

Understand It with Pulse | Flag a mistake

11 **A spring with a spring constant of 250 N/m is stretched 0.12 m from its equilibrium position. The magnitude of the force exerted by the spring is**

- **A** 3.0 N
- **B** 30 N
- **C** 300 N
- **D** 2.1×10^3 N

Understand It with Pulse | Flag a mistake

12 **An air column that is closed at one end can support standing waves with frequencies that are**

- **A** all whole-number multiples of the fundamental frequency
- **B** only odd multiples of the fundamental frequency
- **C** only even multiples of the fundamental frequency
- **D** only the fundamental frequency itself

Understand It with Pulse | Flag a mistake

13 **A ball rolls off the edge of a table 1.25 m above the floor with a horizontal speed of 2.0 m/s. Use g = 9.81 m/s². The ball lands a horizontal distance from the base of the table of approximately**

- A 0.25 m
- B 4.0 m
- C 1.0 m
- D 0.50 m

Understand It with Pulse | Flag a mistake

14 **Two blocks, of mass 3.0 kg and 5.0 kg, are connected by a light rope on a frictionless horizontal surface. A horizontal force of 40 N is applied to the 5.0 kg block, pulling both blocks to the right. The tension in the rope is**

- A 40 N
- B 25 N
- C 5.0 N
- D 15 N

Understand It with Pulse | Flag a mistake

15 **Two spherical objects, each with a mass of 100 kg, have their centres 2.0 m apart. Use $G = 6.67 \times 10^{-11}$ N · m²/kg². The magnitude of the gravitational force between them, expressed in the form $a.bc \times 10^{-7}$ N, has a.bc = _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

16 **A pulse travelling along a rope reaches the end of the rope, which is firmly tied to a wall. The reflected pulse is**

A inverted compared with the incoming pulse

B upright, with a larger amplitude than the incoming pulse

C completely absorbed by the wall

D upright, with the same amplitude as the incoming pulse

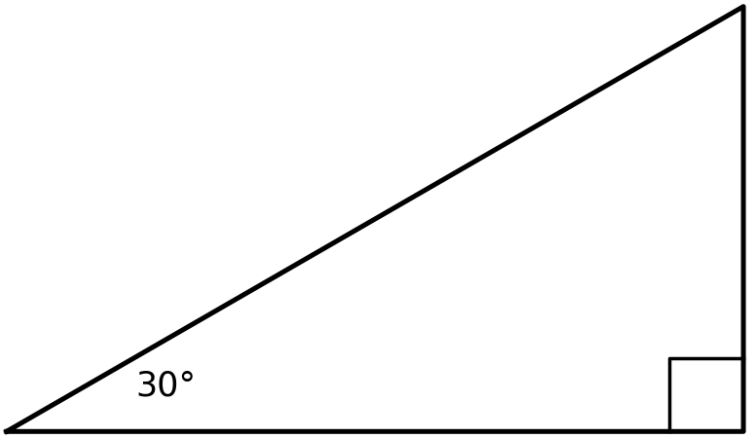
Understand It with Pulse | Flag a mistake

17 **A boat heads directly across a river, moving at 4.0 m/s relative to the water, perpendicular to the current. The river flows at 3.0 m/s. The speed of the boat relative to the shore is**

- A 7.0 m/s
- B 1.0 m/s
- C 3.5 m/s
- D 5.0 m/s

Understand It with Pulse | Flag a mistake

18 **The triangle shows a frictionless ramp. A block slides down the ramp. Use g = 9.81 m/s². The acceleration of the block down the ramp is**



A 8.5 m/s²

B 9.81 m/s²

C 4.9 m/s²

D 2.5 m/s²

Understand It with Pulse | Flag a mistake

19 **A satellite moves in a circular orbit around Earth, with Earth's gravity providing the centripetal force. If the radius of the orbit is increased to four times its original value, the orbital speed of the satellite will be**

- **A** four times as great
- **B** two times as great
- **C** unchanged
- **D** one-half as great

Understand It with Pulse | Flag a mistake

20 **A 0.50 kg mass attached to a spring with a spring constant of 80 N/m oscillates on a frictionless surface. Using $f = \frac{1}{2}\pi\sqrt{\frac{k}{m}}$, the frequency of oscillation, to the nearest tenth, is ____ Hz.**

ANSWER

Understand It with Pulse | Flag a mistake

21 **A ball is launched at 15 m/s at an angle of 53° above the horizontal. Use g = 9.81 m/s². The maximum height reached above the launch point is**

- **A** 11 m
- **B** 4.3 m
- **C** 7.3 m
- **D** 23 m

Understand It with Pulse | Flag a mistake

22 **A box sliding across a horizontal floor comes to rest under the force of kinetic friction alone. The coefficient of kinetic friction is 0.30. Use g = 9.81 m/s². The magnitude of the acceleration of the box, in m/s² to the nearest hundredth, is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

23 **A spring with a spring constant of 400 N/m is compressed 0.10 m and used to launch a 0.050 kg ball straight upward. Ignoring air resistance, the maximum height reached by the ball, in metres and to the nearest tenth, is ____**

ANSWER _____

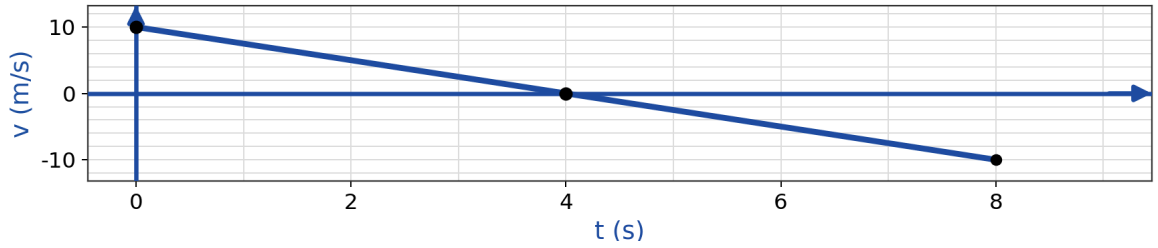
Understand It with Pulse | Flag a mistake

24 **An air column closed at one end has a length of 0.25 m. The speed of sound in the air is 343 m/s. The fundamental frequency of the column is ____ Hz.**

ANSWER _____

Understand It with Pulse | Flag a mistake

25 **The velocity-time graph shows an objects motion over 8.0 s. The displacement of the object during this interval is**



A 40 m

B 0 m

C 80 m

D -40 m

Understand It with Pulse | Flag a mistake

26 **A person with a mass of 70 kg stands on a scale in an elevator. The elevator accelerates upward at 2.0 m/s². Use g = 9.81 m/s². The reading on the scale, expressed as a force, is**

- **A** 6.9×10^2 N
- **B** 8.3×10^2 N
- **C** 5.5×10^2 N
- **D** 9.7×10^2 N

Understand It with Pulse | Flag a mistake

27 **A satellite orbits Earth in a circular orbit with a radius of 7.0×10^6 m. Use G = 6.67×10^{-11} N · m²/kg² and a mass for Earth of 5.97×10^{24} kg. The orbital speed of the satellite is**

- **A** 5.7 km/s
- **B** 57 km/s
- **C** 11 km/s
- **D** 7.5 km/s

Understand It with Pulse | Flag a mistake

28 **A pendulum is to be built with a period of exactly 2.0 s on Earth. Using $T = 2\pi\sqrt{\frac{L}{g}}$ with $g = 9.81\ \frac{m}{s^2}$, the required length, to the nearest hundredth, is _____ m.**

ANSWER

Understand It with Pulse | Flag a mistake

29 **A velocity-time graph for an object is a straight line passing through the points (0 s, 4 m/s) and (8 s, 20 m/s). The acceleration of the object is**

A. 2.0 m/s²

B. 0.50 m/s²

C. 2.5 m/s²

D. 3.0 m/s²

Understand It with Pulse | Flag a mistake

30 **Two forces act on a 5.0 kg object at rest on a frictionless surface: a force of 30 N directed east and a force of 40 N directed north. The magnitude of the acceleration of the object is**

- **A** 10 m/s²
- **B** 14 m/s²
- **C** 2.0 m/s²
- **D** 70 m/s²

Understand It with Pulse | Flag a mistake

31 **A puck slides in a horizontal circle on a frictionless surface, held by a string. At any instant, the direction of the acceleration of the puck is**

- **A** along the tangent, in the direction of motion
- **B** toward the centre of the circle
- **C** directly away from the centre of the circle
- **D** zero, because the speed is constant

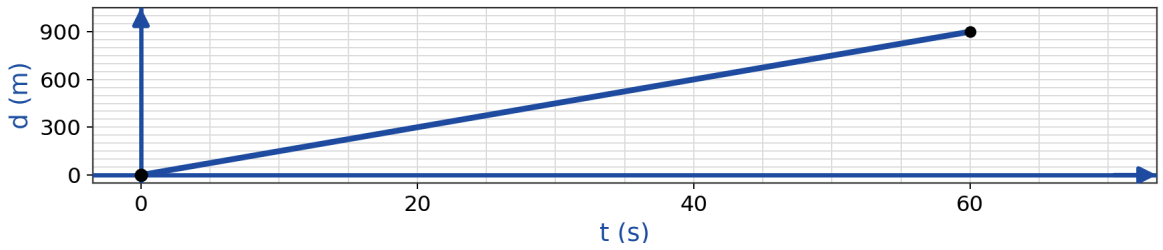
Understand It with Pulse | Flag a mistake

32 **A buoy floating on water rises and falls as waves pass under it. The buoy completes 15 full oscillations in 30 s. The period of the waves is**

- **A** 0.50 s
- **B** 15 s
- **C** 2.0 s
- **D** 450 s

Understand It with Pulse | Flag a mistake

33 **The position-time graph shows a cyclist moving at a constant speed. The speed of the cyclist is**



- **A** 0.067 m/s
- **B** 54 m/s
- **C** 15 m/s
- **D** 54000 m/s

Understand It with Pulse | Flag a mistake

34 **A 10 kg object is taken from Earth to the Moon, where g = 1.63 m/s². Compared with its values on Earth, the object on the Moon has**

A less mass and less weight

B the same mass and more weight

C the same mass and less weight

D more mass and the same weight

Understand It with Pulse | Flag a mistake

35 **A turntable makes 30 revolutions in 45 s. The period of the rotation, in seconds and to the nearest tenth, is _____**

ANSWER _____

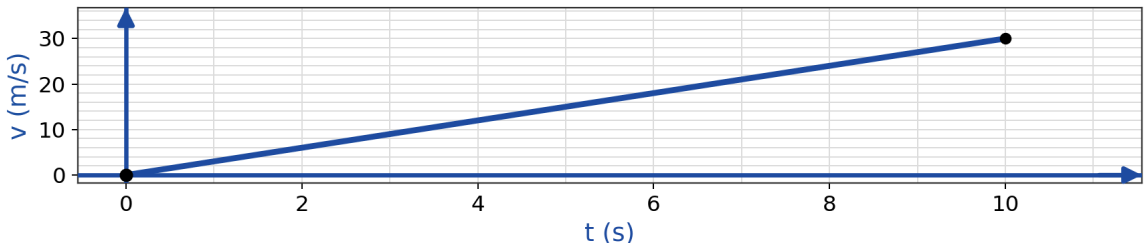
Understand It with Pulse | Flag a mistake

36 **Which of the following statements about mechanical waves is correct?**

- **A** They can travel through a vacuum.
- **B** They transfer matter from one place to another.
- **C** They always travel at the speed of light.
- **D** They require a material medium in order to travel.

Understand It with Pulse | Flag a mistake

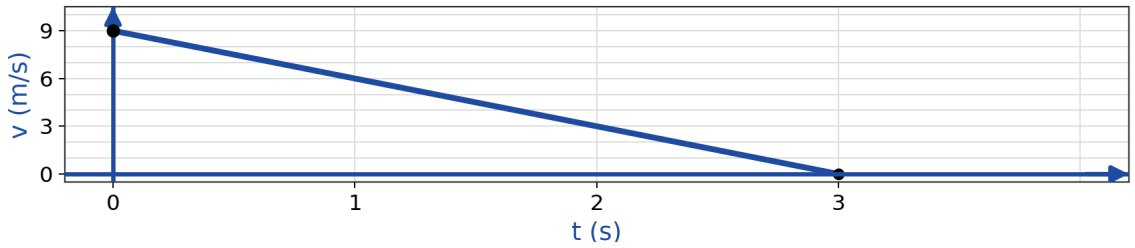
37 **The velocity-time graph shows a car accelerating uniformly from rest. The acceleration of the car is**



- **A** 0.33 m/s²
- **B** 3.0 m/s²
- **C** 30 m/s²
- **D** 300 m/s²

Understand It with Pulse | Flag a mistake

38 **The velocity-time graph shows a box sliding across a horizontal floor and slowing under kinetic friction alone. Use g = 9.81 m/s². The coefficient of kinetic friction between the box and the floor is**



A 0.31

B 0.92

C 0.29

D 0.34

Understand It with Pulse | Flag a mistake

39 **A spring is stretched 0.25 m by an applied force of 45 N. The spring constant, in N/m, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

40 **A simple pendulum has a length of 0.65 m. Using g = 9.81 m/s², the frequency of the pendulum, to the nearest hundredth, is _____ Hz.**

ANSWER _____

Understand It with Pulse | Flag a mistake

41 **A car brakes uniformly at 4.0 m/s² over a distance of 72 m and slows to a final speed of 6.0 m/s. Its initial speed, in metres per second, to the nearest tenth, is**

ANSWER _____

Understand It with Pulse | Flag a mistake

42 **A block rests on a ramp inclined at 28° to the horizontal and is on the verge of sliding down the ramp. The coefficient of static friction between the block and the ramp, to the nearest hundredth, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

43 **A car travels around a flat curve of radius 25 m. The coefficient of static friction between the tires and the road is 0.60. Use g = 9.81 m/s². The maximum speed at which the car can round the curve without sliding, in m/s and to the nearest tenth, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

44 A mass attached to a spring with a spring constant of 120 N/m oscillates with a period of 0.90 s on a frictionless surface. Using $T = 2\pi\sqrt{\frac{m}{k}}$, the mass, to the nearest tenth, is _____ kg.

ANSWER _____

Understand It with Pulse | Flag a mistake

45 A ball is thrown horizontally at 15 m/s from the top of a cliff 45 m above the ground. Use g = 9.81 m/s². The time it takes the ball to reach the ground is approximately

A 2.1 s

B 4.5 s

C 3.0 s

D 9.2 s

Understand It with Pulse | Flag a mistake

46 A 14 kg crate on a horizontal floor is pulled by a force of 90 N at an angle of 35° above the horizontal. The coefficient of kinetic friction between the crate and the floor is 0.30. Use g = 9.81 m/s². The acceleration of the crate, in m/s² to the nearest tenth, is ____

ANSWER _____

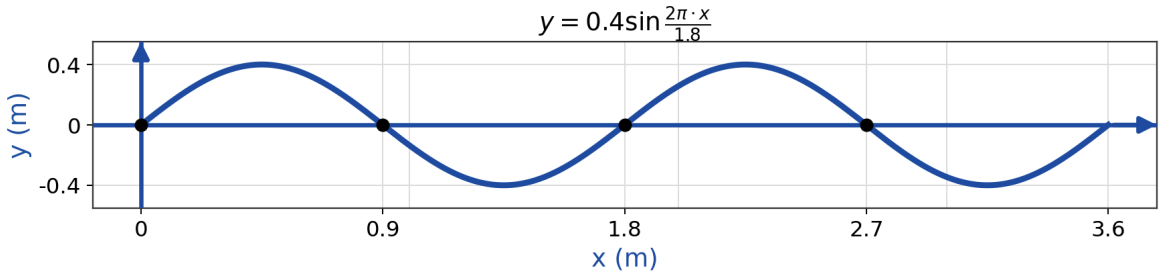
Understand It with Pulse | Flag a mistake

47 **A 3.0 kg block slides down a frictionless incline, dropping a vertical height of 3.2 m. The block starts with a speed of 3.0 m/s. Use g = 9.81 m/s². The speed of the block at the bottom, in m/s and to the nearest tenth, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

48 **The graph shows a wave on a stretched string. The fundamental frequency of the string is 180 Hz. The speed of waves in the string is**



A 162 m/s

B 324 m/s

C 90 m/s

D 648 m/s

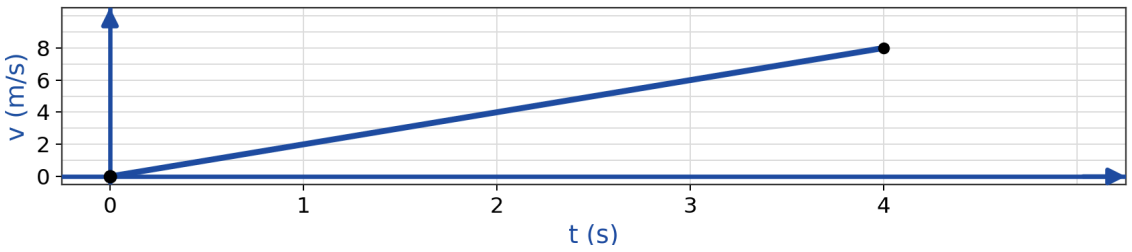
Understand It with Pulse | Flag a mistake

49 **A projectile is launched at a fixed speed and lands at the same height from which it was launched. The launch angle that produces the maximum horizontal range is**

- **A** 30°
- **B** 60°
- **C** 90°
- **D** 45°

Understand It with Pulse | Flag a mistake

50 **The velocity-time graph shows a 6.0 kg block on a frictionless horizontal surface, pulled by a rope over a pulley. The tension in the rope, in newtons, is ____**



ANSWER _____

Understand It with Pulse | Flag a mistake

ANSWER KEY

1. B
2. A
3. 4
4. C
5. D
6. C
7. A
8. A
9. A
10. A
11. B
12. B
13. C
14. D
15. 1.67
16. A
17. D
18. C
19. D
20. 2
21. C
22. 2.94
23. 4.1
24. 343
25. B
26. B
27. D
28. 0.99
29. A
30. A
31. B
32. C
33. C
34. C
35. 1.5
36. D
37. B
38. A
39. 180
40. 0.62
41. 24.7
42. 0.53
43. 12.1
44. 2.5
45. C
46. 3.4
47. 8.5
48. B
49. D
50. 12

© 2026 Brett Robbins. All Rights Reserved.