ALBERTA PHYSICS 20 · UNIT B · 10 QUESTIONS

Dynamics — 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 **Two masses, 3.0 kg and 7.0 kg, hang from opposite ends of a light rope that passes over a frictionless pulley. Use g = 9.81 m/s². The magnitude of the acceleration of the masses is**

- **A** 3.9 m/s²
- **B** 9.8 m/s²
- **C** 2.5 m/s²
- **D** 5.9 m/s²

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2 **A rocket accelerates upward at liftoff. The upward force that accelerates the rocket is exerted by**

A the air below the rocket, which the exhaust gases push against

B the hot gases expanding inside the rocket engine

C the exhaust gases, which the rocket pushes downward

D the launch pad, as the rocket pushes down on it

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3 **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 _____

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4 **An elevator and its occupants have a total mass of 800 kg. The elevator accelerates upward at 1.2 m/s². Use g = 9.81 m/s². The tension in the cable supporting the elevator is**

- A 7.8×10^3 N
- B 8.8×10^3 N
- C 9.6×10^3 N
- D 6.9×10^3 N

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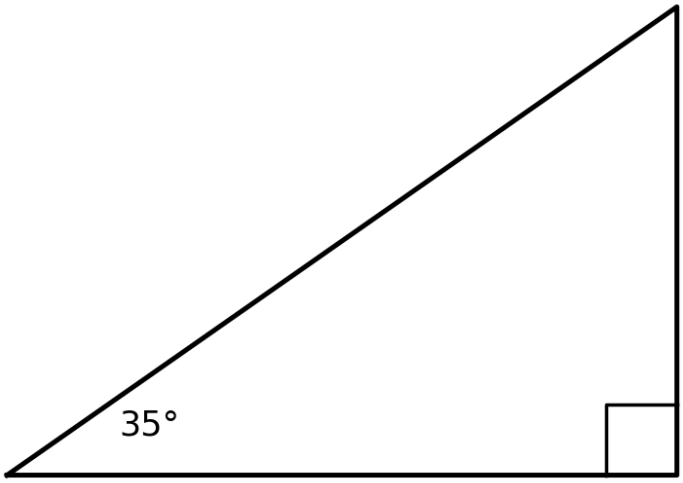
5 **The triangle shows a ramp. A block slides down the ramp with an acceleration of 2.0 m/s². Use g = 9.81 m/s². The coefficient of kinetic friction between the block and the ramp is**



A 0.45

B 0.57

C 0.35

D 0.65

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6 **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 _____

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7 **A skydiver falling through the air reaches terminal velocity, a constant velocity. At terminal velocity,**

A air resistance is greater than the force of gravity on the skydiver

B air resistance is zero, so no net force acts on the skydiver

C the force of gravity no longer acts on the skydiver

D air resistance equals the force of gravity, so the net force is zero

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8 **A 5.0 kg block on a horizontal surface is connected by a light rope over a pulley to a hanging mass of 3.0 kg. The coefficient of kinetic friction between the block and the surface is 0.18. Use g = 9.81 m/s². The acceleration of the system is**

- **A** 1.2 m/s²
- **B** 3.7 m/s²
- **C** 2.6 m/s²
- **D** 4.9 m/s²

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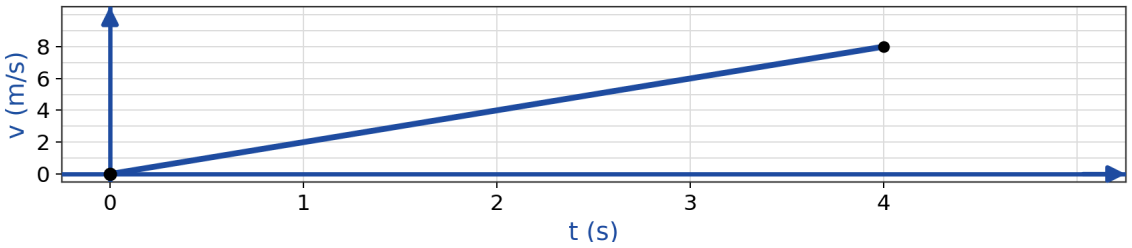
9 **The velocity-time graph shows a 6.0 kg block on a frictionless horizontal surface, pulled by a rope over a pulley. The tension in the rope, in newtons, is ____**



ANSWER _____

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10 **A 9.0 kg block rests on a frictionless ramp inclined at 42° to the horizontal. A light rope attached to the block runs parallel to the ramp and holds the block in place. Use g = 9.81 m/s². The tension in the rope is**

- A 59 N
- B 66 N
- C 88 N
- D 44 N

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ANSWER KEY

1. A
2. C
3. 0.53
4. B
5. A
6. 3.4
7. D
8. C
9. 12
10. A

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