

Brett Robbins Academic Consulting

Physics 20 Practice Test

Unit C: Circular Motion, Work & Energy

10 Questions

Original practice questions written to the Alberta curriculum, in the style of past diploma examinations. Work through each question, then check your answers with the key at the end.

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, contact Brett for clarification.

Question 1

A stone is whirled in a horizontal circle at the end of a string.

The centripetal force that keeps the stone moving in the circle is provided by

- A) the force of gravity
- B) the tension in the string
- C) the normal force
- D) air resistance

Question 2

A car travels at a constant speed of 16 m/s around a flat curve of radius 48 m.

The magnitude of the car's centripetal acceleration, in m/s^2 and to the nearest tenth, is ____

Question 3

A worker pushes a crate across a floor with a constant horizontal force of 120 N.

The crate moves 6.0 m in the direction of the force. The work done by the worker is

- | | |
|----------|-----------|
| A) 720 J | B) 20 J |
| C) 126 J | D) 7400 J |

Question 4

The kinetic energy of a 3.0 kg object moving at 4.0 m/s is

- | | |
|----------|---------|
| A) 6.0 J | B) 12 J |
| C) 24 J | D) 48 J |

Question 5

A 2.5 kg box is lifted 1.6 m at a constant speed. The gain in gravitational potential energy of the box is

- | | |
|----------|---------|
| A) 4.0 J | B) 16 J |
| C) 25 J | D) 39 J |

Question 6

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 |

Question 7

A 0.80 kg ball on a 1.2 m string moves in a horizontal circle at 6.0 m/s.

The magnitude of the centripetal force acting on the ball is

- | | |
|----------|----------|
| A) 3.6 N | B) 4.0 N |
| C) 24 N | D) 43 N |

Question 8

A motor does 2.4×10^3 J of work in 8.0 s.

The power output of the motor, in watts, is ____

Question 9

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

Question 10

A roller coaster car starts from rest at the top of a 18 m hill.

Ignoring friction, the speed of the car at the bottom of the hill is

A) 9.4 m/s

B) 13 m/s

C) 27 m/s

D) 19 m/s

Answer Key

- | | | |
|--------|--------|-------|
| 1. B | 5. D | 9. B |
| 2. 5.3 | 6. A | 10. D |
| 3. A | 7. C | |
| 4. C | 8. 300 | |

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