ARKANSAS PHYSICS · UNIT 1 · 25 QUESTIONS

Kinematics and 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 **A runner covers 120 meters in 8 seconds at a steady speed The speed of the runner is**



A 10 meters per second

B 15 meters per second

C 20 meters per second

D 30 meters per second

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2 **A walker goes 20 meters east and then returns 20 meters west to the start The displacement of the walker for the whole trip is**

- A 40 meters east
- B 0 meters
- C 20 meters east
- D 40 meters west

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3 **A car speeds up from 4 meters per second to 22 meters per second in 6 seconds The acceleration of the car is**

- A 2 meters per second squared
- B 4 meters per second squared
- C 3 meters per second squared
- D 6 meters per second squared

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4

A cart starts from rest and accelerates at 3 meters per second squared for 7 seconds The final speed of the cart is

A 10 meters per second

B 24 meters per second

C 28 meters per second

D 21 meters per second

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5 **A ball starts at 6 meters per second and accelerates at 4 meters per second squared for 5 seconds The displacement of the ball is**



A 80 meters

B 60 meters

C 70 meters

D 90 meters

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6 **A sled starts from rest and accelerates at 4 meters per second squared over 32 meters The final speed of the sled is**

- A 8 meters per second
- B 16 meters per second
- C 12 meters per second
- D 20 meters per second

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7 **Use 10 meters per second squared for gravity A stone dropped from rest falls for 3 seconds The speed of the stone after 3 seconds is**

- A 20 meters per second
- B 40 meters per second
- C 30 meters per second
- D 50 meters per second

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8 **Use 10 meters per second squared for gravity A stone dropped from rest falls for 2 seconds The distance the stone falls in 2 seconds is**

- A 10 meters
- B 40 meters
- C 5 meters
- D 20 meters

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9 **A ball is thrown horizontally at 12 meters per second and stays in the air for 2.5 seconds The horizontal distance traveled by the ball is**

- A 30 meters
- B 24 meters
- C 36 meters
- D 40 meters

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10 **Use 10 meters per second squared for gravity A ball is thrown straight up at 30 meters per second The time taken to reach the top of its flight is**

- A 2 seconds
- B 3 seconds
- C 4 seconds
- D 5 seconds

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11 **A wooden crate of mass 6 kilograms is pushed with a force of 24 newtons The acceleration produced is**



A 2 meters per second squared

B 6 meters per second squared

C 4 meters per second squared

D 8 meters per second squared

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12 **A mass of 5 kilograms sits on a table Use 10 meters per second squared for gravity The weight of the mass is**

- A 40 newtons
- B 60 newtons
- C 25 newtons
- D 50 newtons

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13 **A box is pushed east with 20 newtons and west with 12 newtons The net force on the box is**

- A 8 newtons east
- B 8 newtons west
- C 32 newtons east
- D 32 newtons west

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14 **The coefficient of friction is 0.4 and the normal force on a block is 50 newtons The maximum friction force on the block is**

A 10 newtons

B 20 newtons

C 15 newtons

D 25 newtons

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15 **A block of mass 10 kilograms rests on a slope Use 10 meters per second squared for gravity The component of its weight down a 30 degree slope is**



A 25 newtons

B 75 newtons

C 50 newtons

D 100 newtons

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16 **A mass of 3 kilograms hangs at rest from a rope Use 10 meters per second squared for gravity The tension in the rope is**

- A 10 newtons
- B 20 newtons
- C 40 newtons
- D 30 newtons

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17 **A person pushes on a wall and the wall pushes back on the person The two forces in this action reaction pair are**

- A Equal in size and opposite in direction
- B Equal in size and the same in direction
- C Unequal in size and opposite in direction
- D Acting on the same object only

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18 **Inertia is best described as the resistance of an object to a change in its**

- **A** Temperature
- **B** Motion
- **C** Mass
- **D** Shape

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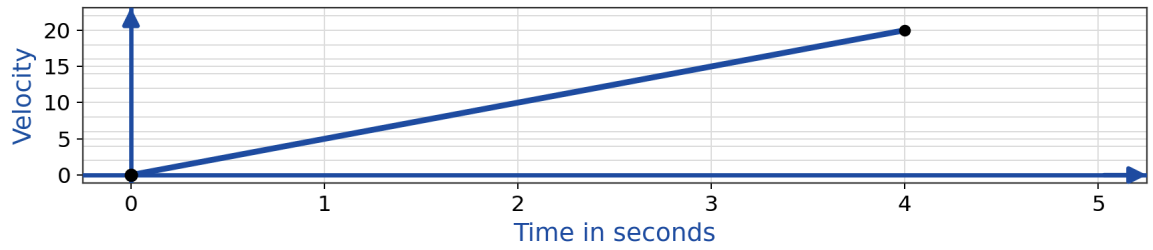
19 **The graph shows velocity against time for a moving object The acceleration of the object is**



- **A** 0.2 meters per second squared
- **B** 20 meters per second squared
- **C** 5 meters per second squared
- **D** 80 meters per second squared

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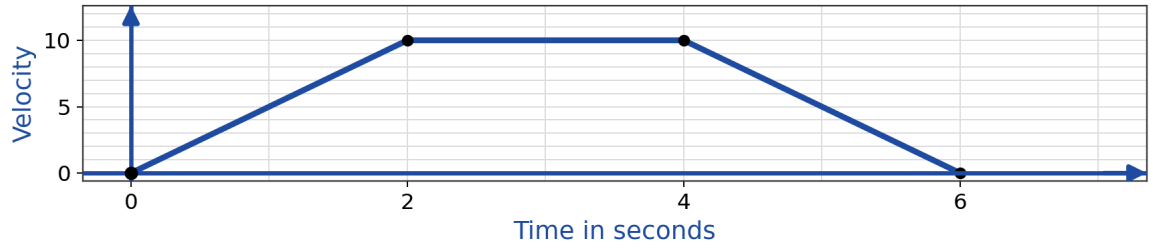
20 **The graph shows velocity against time for a cart The distance traveled by the cart in 6 seconds is**



A 30 meters

B 50 meters

C 60 meters

D 40 meters

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21 **A car moves in a circle of radius 16 meters at a speed of 8 meters per second The centripetal acceleration of the car is**



A 4 meters per second squared

B 2 meters per second squared

C 8 meters per second squared

D 16 meters per second squared

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22 **A mass of 2 kilograms moves in a circle of radius 3 meters at a speed of 6 meters per second The centripetal force on the mass is**

- A 12 newtons
- B 24 newtons
- C 36 newtons
- D 48 newtons

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23 **A car travels east at 20 meters per second and a truck ahead travels east at 15 meters per second The velocity of the car relative to the truck is**

- A 5 meters per second west
- B 35 meters per second east
- C 5 meters per second east
- D 35 meters per second west

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24 **A cyclist has a total displacement of 90 meters in 15 seconds The average velocity of the cyclist is**

A 5 meters per second

B 9 meters per second

C 15 meters per second

D 6 meters per second

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25 **A train starts from rest and accelerates at 2 meters per second squared for 9 seconds What is its final speed in meters per second**



ANSWER

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ANSWER KEY

1. B
2. B
3. C
4. D
5. A
6. B
7. C
8. D
9. A
10. B
11. C
12. D
13. A
14. B
15. C
16. D
17. A
18. B
19. C
20. D
21. A
22. B
23. C
24. D
25. 18

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