ALBERTA SCIENCE 20 · UNIT B · 25 QUESTIONS

Changes in Motion — 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 km in 3.0 h. The average speed of the car is**

- A 40 km/h
- B 80 km/h
- C 120 km/h
- D 720 km/h

Understand It with Pulse | Flag a mistake

2 **A student walks 4 m east and then 4 m west, returning to the starting point. The total distance travelled and the total displacement are**

- A Distance: 0 m Displacement: 0 m
- B Distance: 8 m Displacement: 8 m east
- C Distance: 8 m Displacement: 0 m
- D Distance: 0 m Displacement: 8 m west

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3 **Which of the following quantities is a vector quantity?**

A Distance

B Speed

C Time

D Displacement

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4 **A cyclist moves at a constant speed of 36 km/h. This speed, in metres per second, is _____**

ANSWER _____

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5 **A car rounds a curve at a constant speed. The car is accelerating because**

- **A** its speed is increasing
- **B** its speed is decreasing
- **C** its velocity is changing because its direction is changing
- **D** its mass is changing

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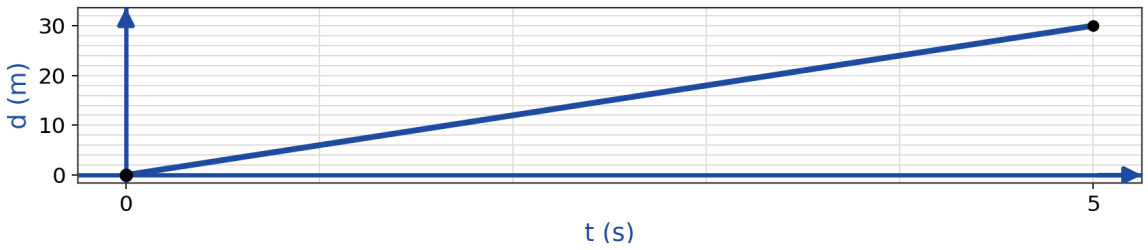
6 **The distance-time graph shows a boat moving east at a constant speed. The average velocity of the boat is**



- **A** 0.17 m/s east
- **B** 6.0 m/s east
- **C** 25 m/s east
- **D** 150 m/s east

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7 **A sprinter starts from rest and reaches a speed of 20 m/s in 5.0 s. The sprinter's average acceleration is**

- **A** 0.25 m/s²
- **B** 100 m/s²
- **C** 4.0 m/s²
- **D** 20 m/s²

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8 **A book sits at rest on a table. According to Newton's first law, the book remains at rest because**

- **A** the forces acting on it are unbalanced
- **B** the net force acting on it is zero
- **C** no forces act on it
- **D** gravity does not act on objects at rest

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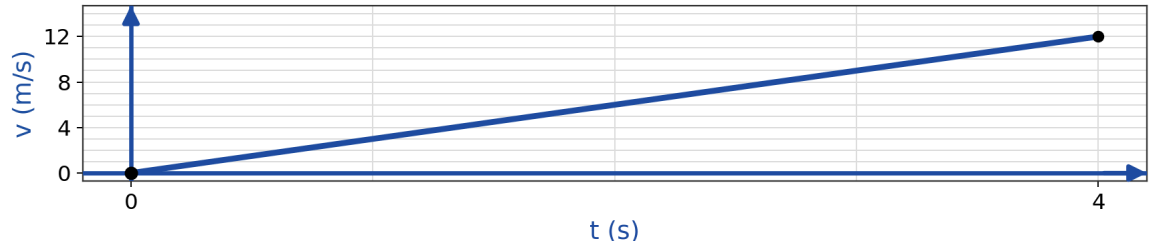
9 **The velocity-time graph shows a sled speeding up uniformly. The acceleration of the sled is**



- **A** 0.25 m/s²
- **B** 3.0 m/s²
- **C** 12 m/s²
- **D** 48 m/s²

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10 **The weight, in newtons, of a 60 kg student on Earth is _____ Use g = 9.81 m/s². Record your answer to the nearest newton.**

ANSWER _____

Understand It with Pulse | Flag a mistake

11 **A car travelling at 10 m/s accelerates at 2.0 m/s² for 5.0 s. The distance travelled by the car during this time is**

- **A** 75 m
- **B** 50 m
- **C** 100 m
- **D** 125 m

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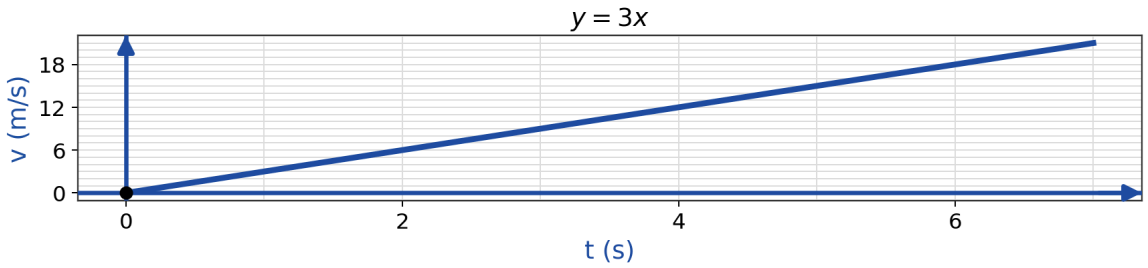
12 **The graph shows the velocity of a cart accelerating uniformly from rest. The velocity after 6 s is**



A 6.0 m/s

B 12 m/s

C 18 m/s

D 54 m/s

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13 **A net force of 120 N acts on a 15 kg crate. The acceleration of the crate is**

- A 0.13 m/s²
- B 2.0 m/s²
- C 135 m/s²
- D 8.0 m/s²

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14 **A 20 kg box slides across a horizontal floor. The coefficient of kinetic friction is 0.30 and g = 9.81 m/s². The force of kinetic friction on the box is approximately**

- A 6.0 N
- B 59 N
- C 196 N
- D 588 N

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15 **The momentum, in kg · m/s, of a 1200 kg car travelling at 15 m/s is _____ Record your answer to the nearest whole number.**

ANSWER

Understand It with Pulse | Flag a mistake

16 **Airbags reduce injuries in a car crash because, compared with hitting the dashboard, the passenger**

A experiences the same impulse over a longer time, so the average force is smaller

B experiences a larger impulse over a shorter time

C experiences the same impulse over a shorter time, so the average force is smaller

D has no change in momentum

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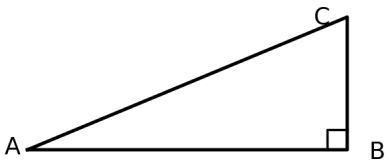
17 **A hiker walks 12 m east from A to B, then 5.0 m north from B to C. The diagram shows the path. The magnitude of the displacement from A to C is**



- **A** 5.0 m
- **B** 12 m
- **C** 13 m
- **D** 17 m

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18 **A worker pushes a cart with a horizontal force of 50 N over a distance of 8.0 m. The work done by the worker is**

- A 6.3 J
- B 42 J
- C 250 J
- D 400 J

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19 **A 5.0 kg toolbox is raised 3.0 m above the ground. Use g = 9.81 m/s². The gravitational potential energy of the toolbox, relative to the ground, is approximately**

- A 147 J
- B 15 J
- C 49 J
- D 441 J

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20 **A marble rolls from rest down a frictionless ramp that drops 4.9 m vertically. Use g = 9.81 m/s². The speed of the marble at the bottom, in metres per second to the nearest tenth, is _____**

ANSWER _____

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21 **According to Newton's third law, an action force and its reaction force**

A act on the same object

B cancel each other out because they are equal and opposite

C only occur when the two objects are in contact

D act on two different objects

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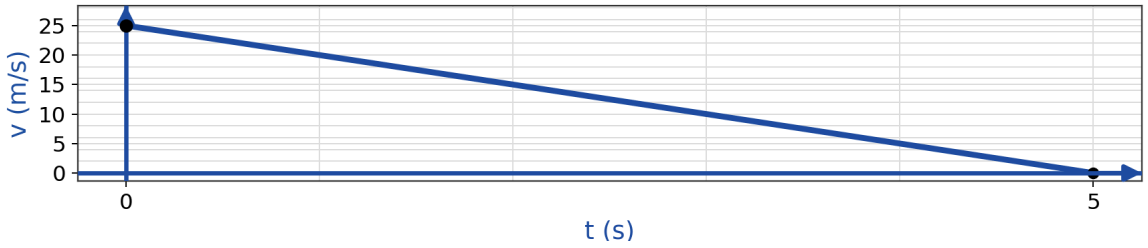
22 **The velocity-time graph shows a car braking uniformly to a stop. The braking distance, in metres, is _____.**



ANSWER _____

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23 **A 10 kg box on a horizontal floor is pulled with an applied force of 80 N. The force of friction opposing the motion is 30 N. The acceleration of the box, in m/s², is _____**

ANSWER _____

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24 **Two carts collide on a level track and stick together. In this collision, the quantity that is conserved is**

A speed

B kinetic energy

C force

D momentum

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25 **A 1000 kg car travelling at 20 m/s is stopped by a constant friction force of 5000 N. Using the work-energy relationship, the stopping distance, in metres, is _____**

ANSWER _____

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ANSWER KEY

1. B
2. C
3. D
4. 10
5. C
6. B
7. C
8. B
9. B
10. 589
11. A
12. C
13. D
14. B
15. 18000
16. A
17. C
18. D
19. A
20. 9.8
21. D
22. 62.5
23. 5
24. D
25. 40

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