PHYSICS 3204 · NEWFOUNDLAND AND LABRADOR

# Physics 3204

## Practice Test

### Unit A: Application of Vectors

25 Questions

Original practice test based on the Newfoundland and Labrador curriculum. Work through each question, then check your answers at the end.

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.

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Question 1

A vector quantity differs from a scalar quantity because a vector has both magnitude and

A) mass

B) direction

C) temperature

D) energy

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Question 2

Which of the following is a vector quantity?

A) speed

B) velocity

C) distance

D) time

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Question 3

Which of the following is a scalar quantity?

A) velocity

B) acceleration

C) speed

D) force

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Question 4

Displacement is best described as change in

A) speed

B) time

C) mass

D) position

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Question 5

Two vectors of equal magnitude in opposite directions sum to

A) zero

B) double the magnitude

C) half the magnitude

D) a scalar

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Question 6

A vector with east component 3 units and north component 4 units has a magnitude found by

A) simple addition

B) the Pythagorean theorem

C) simple subtraction

D) multiplication only

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Question 7

When a vector is multiplied by a negative scalar, its direction

A) stays the same

B) becomes zero

C) reverses

D) becomes a scalar

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Question 8

The resultant of two perpendicular vectors is the vector sum, found by placing vectors

A) tail to tail only

B) in parallel only

C) at right angles only

D) head to tail

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Question 9

A boat crossing a river has a velocity relative to the shore that is the vector sum of its velocity relative to the water and the velocity of the

A) water relative to the shore

B) boat relative to the air

C) shore relative to the boat

D) river relative to the boat

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Question 10

In projectile motion with no air resistance, the horizontal component of velocity is

A) increasing

B) constant

C) decreasing to zero

D) zero throughout

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Question 11

In projectile motion with no air resistance, the vertical acceleration is

A) zero

B) increasing upward

C) constant downward

D) changing sign twice

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Question 12

At the highest point of a projectile path, the vertical component of velocity is

A) at a maximum

B) equal to the horizontal component

C) negative and large

D) zero

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Question 13

A vector can be resolved into components that are at right angles to each other, usually called

A) rectangular components

B) scalar components

C) parallel components

D) resultant components

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Question 14

Relative velocity of object A with respect to object B is the velocity of A minus the velocity of

A) A

B) B

C) the ground only

D) the observer only

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Question 15

If two vectors act at an angle, the magnitude of their resultant is greatest when the angle between them is

A) 90 degrees

B) 180 degrees

C) 0 degrees

D) 270 degrees

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Question 16

A displacement has east component 3 metres and north component 4 metres. Its magnitude in metres is

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Question 17

A displacement has east component 6 metres and north component 8 metres. Its magnitude in metres is

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Question 18

A displacement has east component 5 metres and north component 12 metres. Its magnitude in metres is

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Question 19

A vector of magnitude 10 units has a component of 6 units in one direction. The perpendicular component in units is

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Question 20

Two displacements of 30 metres east and 40 metres north are added. The resultant magnitude in metres is

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Question 21

A boat moves 12 metres per second across a river and the river moves 5 metres per second downstream. The speed relative to the shore in metres per second is

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Question 22

A velocity has components 9 metres per second east and 12 metres per second north. Its speed in metres per second is

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Question 23

A projectile is launched with horizontal velocity 20 metres per second. After 3 seconds with no air resistance, its horizontal velocity in metres per second is

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Question 24

A projectile rises for 2 seconds to its highest point. Using $g = 10$ metres per second squared, its initial vertical velocity in metres per second is

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Question 25

Two vectors of 7 units and 24 units are perpendicular. Their resultant magnitude in units is

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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. 5
17. 10
18. 13
19. 8
20. 50
21. 13
22. 15
23. 20
24. 20
25. 25

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