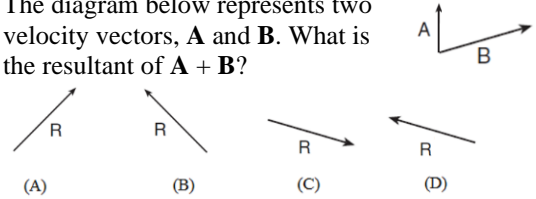


Vectors and Projectiles Review
Honors Physics

Name _____

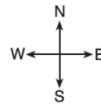
- A baseball dropped from the roof of a tall building takes 3.1 seconds to hit the ground. How tall is the building? [Neglect air resistance.]
 - 15 m
 - 30 m
 - 47 m
 - 94 m
- A ball is thrown vertically upward with an initial velocity of 29.4 meters per second. What is the maximum height reached by the ball? [Neglect air resistance.]
 - 14.7 m
 - 29.4 m
 - 44.1 m
 - 88.1 m
- A ball thrown vertically upward reaches a maximum height of 30 meters above the surface of Earth. At its maximum height, the speed of the ball is
 - 0.0 m/s
 - 3.1 m/s
 - 9.8 m/s
 - 24 m/s
- What is the speed of a 2.5-kilogram mass after it has fallen freely from rest through a distance of 12 meters?
 - 4.8 m/s
 - 15 m/s
 - 30 m/s
 - 43 m/s
- Explain the difference between a scalar and a vector quantity. Give an example of each.
- A child walks 5 meters north, then 4 meters east, and finally 2 meters south. What is the magnitude of the resultant displacement of the child after the entire walk?
 - 1.0 m
 - 5.0 m
 - 3.0 m
 - 11.0 m
- A golf ball is hit with an initial velocity of 15 meters per second at an angle of 35° above the horizontal. What is the vertical component of the golf ball's initial velocity?
 - 8.6 m/s
 - 9.8 m/s
 - 12 m/s
 - 15 m/s

- The diagram below represents two velocity vectors, **A** and **B**. What is the resultant of **A** + **B**?



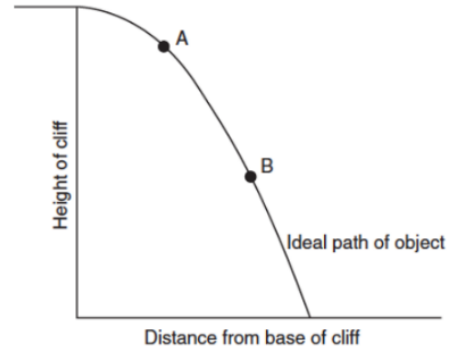
A stream is 30 meters wide and its current flows southward at 1.5 meters per second. A toy boat is launched with a velocity of 2.0 meters per second eastward from the west bank of the stream.

- Use a ruler to draw a vector diagram. Use the scale of 1 cm = 1 m/s. Draw and label a vector that represents the resultant velocity.



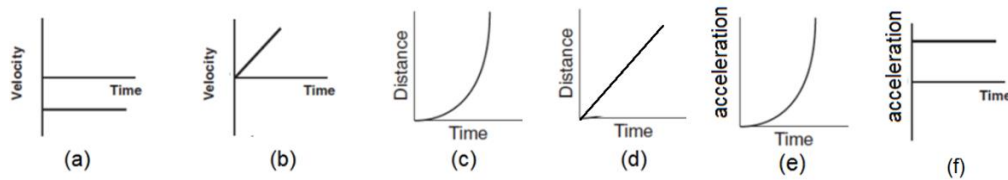
- What is the magnitude of the boat's resultant velocity as it crosses the stream?
 - 0.5 m/s
 - 2.5 m/s
 - 3.0 m/s
 - 3.5 m/s
- How much time is required for the boat to reach the opposite bank of the stream?
 - 8.6 s
 - 12 s
 - 15 s
 - 60 s
- A golf ball is hit at an angle of 45° above the horizontal. What is the acceleration of the golf ball at the highest point in its trajectory?
 - 9.8 m/s^2 upward
 - 9.8 m/s^2 downward
 - 6.9 m/s^2 horizontal
 - 0 m/s^2
- At what angle will a ball travel the farthest horizontally if kicked with the same velocity?
 - 35°
 - 45°
 - 55°
 - 75°

An object was projected horizontally from a tall cliff. The diagram represents the path of the object, neglecting friction.



14. How does the magnitude of the horizontal component of the object's velocity at **A** compare with the magnitude of the horizontal component of the object's velocity at point **B**?
15. How does the magnitude of the vertical component of the object's velocity at point **A** compare with the magnitude of the vertical component of the object's velocity at point **B**?
16. How does the magnitude of the acceleration of the object at point **A** compare with the magnitude acceleration at point **B**?

17. A student throws a baseball vertically upward and then catches it. Which graph best shows this motion?



18. Which graph(s) show a car driving on level ground with a constant velocity?
19. Which graph(s) show a car driving on level ground with a constant acceleration?
20. Which 3 graphs could be used to describe an object that is dropped from rest?

21. In the *Mythbusters* video, they tested a handgun that was fired horizontally from 1.5 meters above the ground. The bullet was fired with a velocity of 192 meters per second.

- a) How long was the bullet in the air?
- b) How far away from the gun did the bullet land?
- c) What was the acceleration of the bullet 0.4 seconds after being fired?

22. A soccer ball is kicked from level ground at 28 m/s at an angle of 25° above the horizontal.

- a) Determine the initial x and y components of the velocity of the ball.
- b) How long is the ball in the air?
- c) How far will the ball go before it strikes the ground?
- d) What are the x and y components of its velocity at the top of its flight?