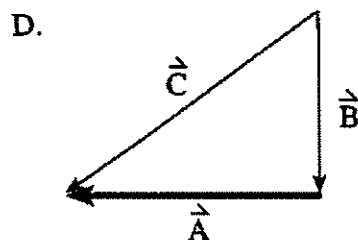
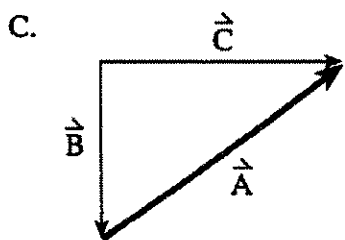
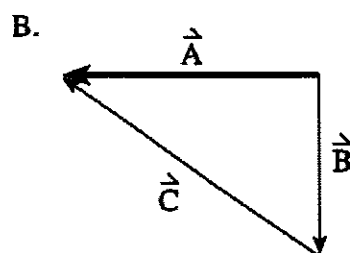
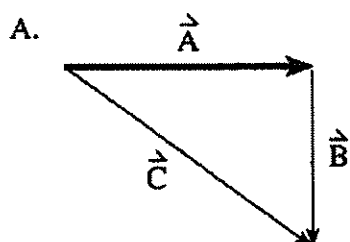


1. Which of the following contains vector quantities only?

- A. mass, speed
- B. energy, velocity
- C. displacement, energy
- D. displacement, velocity

2. Which of the following vector diagrams shows \vec{A} as the sum of \vec{B} and \vec{C} (i.e. $\vec{A} = \vec{B} + \vec{C}$)?



3. A projectile is launched with a velocity of 35 m/s at 55° above the horizontal. What is the maximum height reached by the projectile? Ignore friction.

- A. 5.3 m
- B. 42 m
- C. 54 m
- D. 63 m

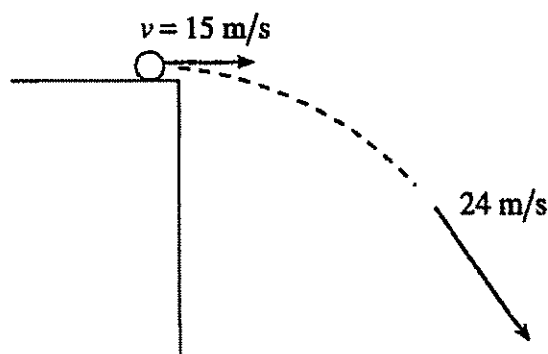
4. Which of the following is a scalar quantity?

- A. work
- B. force
- C. velocity
- D. momentum

5. An astronaut on the moon throws a 5.0 kg wrench vertically upwards with an initial speed of 15 m/s. The acceleration due to gravity on the surface of the moon is one-sixth that on the surface of the earth. What is the maximum height reached by the wrench?

- A. 25 m
- B. 46 m
- C. 69 m
- D. 75 m

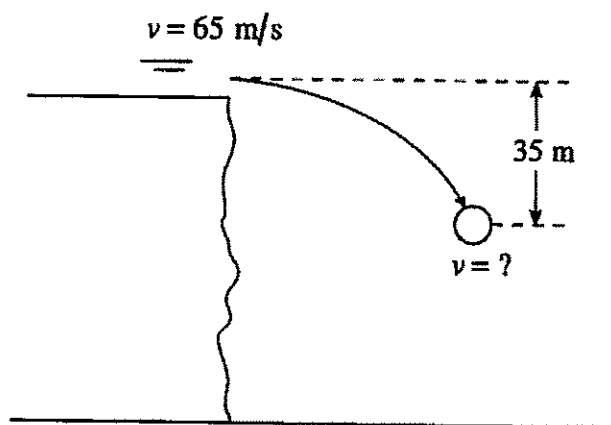
6. A ball rolls off a horizontal roof at 15 m/s.



How far will the ball have fallen vertically when it reaches a speed of 24 m/s?

- A. 4.1 m
- B. 18 m
- C. 29 m
- D. 37 m

7. Which of the following correctly applies to a projectile in the absence of friction?
- A. The vertical velocity is changing.
 - B. The horizontal velocity is changing.
 - C. The vertical acceleration is changing.
 - D. The horizontal acceleration is changing.
8. An 1800 kg car initially travelling at 15 m/s brakes to avoid hitting another car. The car accelerates at -1.9 m/s^2 while braking to a stop. How far does the car travel during its acceleration?
- A. 29 m
 - B. 59 m
 - C. 120 m
 - D. 180 m
9. A 15 kg rock is projected horizontally from a very high cliff at a speed of 65 m/s as shown.

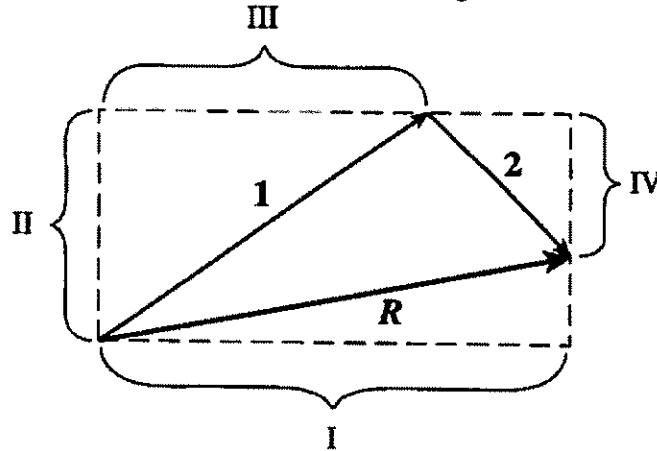


What is the speed of the rock after it has fallen a vertical distance of 35 m?

- A. 26 m/s
- B. 59 m/s
- C. 65 m/s
- D. 70 m/s

10. Which of the following is constant for all projectiles?
- A. vertical velocity
 - B. horizontal velocity
 - C. vertical displacement
 - D. horizontal displacement
11. A projectile is launched at 30 m/s over level ground at an angle of 37° to the horizontal. What maximum height does this projectile reach?
- A. 3.1 m
 - B. 17 m
 - C. 29 m
 - D. 46 m
12. A few minutes after takeoff a jet is heading due east with an air speed of 300 km/h. If the wind is blowing at 60 km/h, towards 40° S of E, what is the jet's ground speed?
- A. 260 km/h
 - B. 340 km/h
 - C. 350 km/h
 - D. 360 km/h
13. Which of the following statements is always correct about an object in motion?
- A. It has a tendency to accelerate.
 - B. A net force must be acting on it.
 - C. It has a tendency to keep moving.
 - D. The net force acting on it must be zero.

14. The diagram below shows the resultant vector R of adding vector 1 and vector 2.

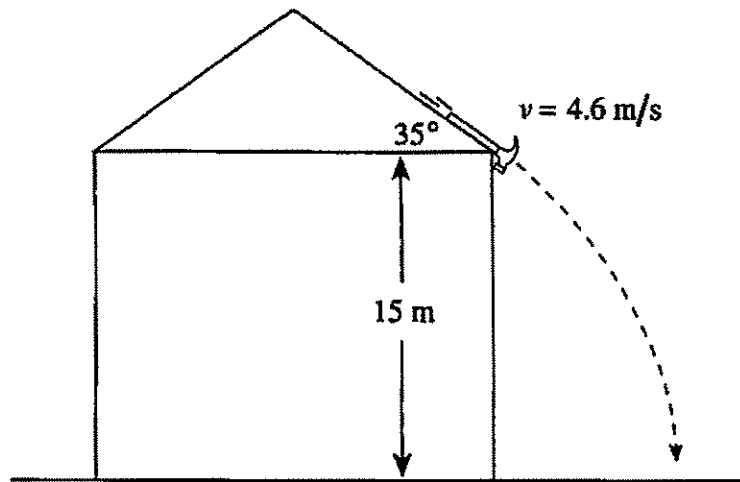


Which of the following represents the magnitude of the vertical component of vector 1?

- A. I
 - B. II
 - C. III
 - D. IV
15. A car accelerates from 30 m/s to 50 m/s in 1.4 s. How far does it travel during this time?

- A. 28 m
- B. 42 m
- C. 56 m
- D. 70 m

16. A hammer slides down a roof sloped at 35° reaching a speed of 4.6 m/s before falling off.



How much time does it take to fall the 15 m to the ground?

(5 marks)