

Practice Exam

1. A ball is thrown up and out from the top of a 50 m high building with a velocity of 5.0 m/s at 30 degrees above horizontal. What is the horizontal component of the velocity when it hits the ground?
 - A) 12.8 m/s
 - B) 8.6 m/s
 - C) 7.4 m/s
 - D) 6.6 m/s
 - E) 4.3 m/s**

2. A fire hydrant can supply 133 cubic feet of water per minute. Convert this rate to cubic centimeters per hour (1 foot = 12 inches, 1 inch = 2.54 cm)
 - A) $2.26 \times 10^8 \text{ cm}^3/\text{h}$**
 - B) $1.21 \times 10^8 \text{ cm}^3/\text{h}$
 - C) $4.03 \times 10^7 \text{ cm}^3/\text{h}$
 - D) $3.17 \times 10^6 \text{ cm}^3/\text{h}$
 - E) $2.43 \times 10^5 \text{ cm}^3/\text{h}$

3. Chris is 15 years old. Find his age in seconds.
- A) 4.7×10^{10} s
 - B) 4.7×10^8 s**
 - C) 3.6×10^8 s
 - D) 3.6×10^{10} s
 - E) 2.1×10^5 s
4. A person sitting on top of a 12 meter tall flagpole throws a ball straight upwards. The ball hits the ground 2 seconds later. What was the initial speed of the ball when it left the person's hand?
- A) **3.8 m/s**
 - B) 7.6 m/s
 - C) 11.4 m/s
 - D) 12.6 m/s
 - E) 15.8 m/s
5. A car traveling 98 km/h is 270 m behind a truck traveling 78 km/h. How long will it take the car to reach the truck?
- A) 25 s
 - B) 38 s
 - C) 45 s
 - D) 49 s**
 - E) 58 s
6. Sarah walks south at a speed of 2.00 m/s for 60.0 minutes, she then turns around and walks north a distance of 3.00×10^3 m in 25.0 minutes. What is the magnitude of Sarah's average velocity during the entire motion?
- A) 0.824 m/s**
 - B) 1.93 m/s
 - C) 2.00 m/s
 - D) 1.79 m/s
 - E) 800 m/s

7. A car begins driving from a stationary position. It accelerates at 4 m/s^2 for 10 seconds, then travels at a steady speed for another 10 seconds, all in the same direction. How much distance has it covered since it started driving?
- A) 200 m
 - B) 400 m
 - C) **600 m**
 - D) 800 m
 - E) 1000 m
8. A car increases its forward velocity uniformly from 40 m/s to 80 m/s while travelling a distance of 200 m. What is its acceleration during this time?
- A) **12 m/s^2**
 - B) 24 m/s^2
 - C) 6 m/s^2
 - D) 48 m/s^2
 - E) 0 m/s^2
9. A ball is thrown upwards with an initial velocity of 22 m/s. What is the maximum height the ball will reach? (Assume that air resistance is negligible)
- A) **25 m**
 - B) 50 m
 - C) 1.2 m
 - D) 2.3 m
 - E) 13 m

10. A construction worker accidentally drops a brick from a high scaffold. What is the velocity of the brick after 5.0 seconds? We choose up as the positive direction. (Assume that air resistance is negligible)

- A) -49 m/s
- B) 49 m/s
- C) 25 m/s
- D) -25 m/s
- E) 0 m/s

11. Vector \vec{A} has a magnitude of 5.0 and points to the east (along the positive x -axis). Vector \vec{B} has a magnitude of 6.0, and points northeast, at a 45-degree angle to the positive x -axis. What is the magnitude of the resultant vector $\vec{A} + \vec{B}$?

- A) 1.0
- B) 4
- C) 8.0
- D) 10
- E) 11

12. As in the previous problem, Vector \vec{A} has a magnitude of 5.0 and points to the east (along the positive x -axis). Vector \vec{B} has a magnitude of 6.0, and points northeast, at a 45-degree angle to the positive x -axis. What is the direction of the resultant vector $\vec{A} + \vec{B}$ measured from the positive x -axis?

- A) -80.0 deg
- B) -10.8 deg
- C) 24.6 deg
- D) 100.5 deg
- E) 170 deg

13. An object is launched from the edge of a 38-meter-high cliff at a speed of 9.9 m/s, at an angle of 28 degrees above the horizontal. How far from the base of the cliff does the object hit the ground?

- A) 25.0 m
- B) 26.5 m
- C) **28.5 m**
- D) 30 m
- E) 32.5 m

14. For general projectile motion with no air resistance, the vertical component of a projectile's acceleration

- A) is always zero.
- B) **remains a non-zero constant.**
- C) continuously increases.
- D) continuously decreases.
- E) first decreases and then increases.

15. An object is launched horizontally from the edge of a cliff at a speed of 7.0 m/s. The object lands on the ground in a bucket that is placed 25 meters from the base of the cliff. How high is the cliff?

- A) 58 m
- B) **62 m**
- C) 68 m
- D) 120 m
- E) 140 m