

Multiple Choice Review:

1. What does it mean exactly when we say that a falling object accelerates at a rate of -9.8 m/s^2 ?
 object increases its speed by 9.8 m/s every second

2. What is acceleration and when do we use -9.8 m/s^2 ?
 acc = rate of change in velocity -9.8 for falling objects

3. What is a scalar? Give two examples.
 something w/ magnitude (mass + time)

4. What is a vector? Give two examples.
 magnitude + direction (velocity, acceleration)

5. What is the sum of two or more vectors called? resultant

6. What quantity does the slope of a distance vs. time graph give you? speed/velocity

7. What quantity does the slope of a velocity vs. time graph give you? acceleration

8. What does a horizontal line on a distance vs. time graph mean? not moving

9. What does a horizontal line on a velocity vs. time graph mean? moving at constant speed

10. What does the area under a velocity vs. time graph give you? $\text{m/s} \cdot \text{s} = \text{m}$ (distance)

11. What is a projectile? Give two examples.
 anything in the air can't control its own motion (ball, cat)

12. At what point during a projectile's flight is it at maximum height? What Δt should you use?

13. What are the units/variables for horizontal velocity? Vertical velocity? Height?
 $v_x (\text{m/s})$ $v_y (\text{m/s})$ $\Delta y (\text{m})$

14. What happens to the velocity of a projectile in the x direction throughout its flight?
 constant

15. What happens to the velocity of a projectile in the y direction throughout its flight?
 decreases 0 increases

16. When do we use the whole time and when do you use the time at the top when solving projectile problems that start and land at the same height?

17. When we shoot a projectile horizontally, explain what shape its path makes. Include a sketch and what v_{iy} is.
 height at peak $v_{iy} = 0$ full Δt (for Δx)

18. If you shoot a bullet and drop a bullet at the same time from the same height in a vacuum (or no air resistance), explain why they hit at the same time. include a sketch.
 full same vertical distance (Δy), so gravity pulls them down at same rate

19. Explain how the velocity of an object is related to its v_x and v_{iy} . Include the mathematical relationship among them.

$$v^2 = v_x^2 + v_{iy}^2$$

20. Explain what happens when you change the angle of a projectile from 45° N of E to 70° .

