



## Lesson 6-5 Projectile Motion

- 1- identify the initial conditions  $y(0)$  and  $y'(0)$ .

An object is dropped from a height of 80 ft.

- A-  $y(0) = 80$  &  $y'(0) = 0$ .
- B-  $y(0) = 0$  &  $y'(0) = 80$
- C-  $y(0) = 80$  &  $y'(0) = -9.8$
- D-  $y(0) = 0$  &  $y'(0) = 0$

- 2- identify the initial conditions  $y(0)$  and  $y'(0)$ .

An object is released from a height of 60 ft with an upward velocity of 10 ft/s.

- A-  $y(0) = 60$  &  $y'(0) = -9.8$
- B-  $y(0) = 0$  &  $y'(0) = 10$
- C-  $y(0) = 60$  &  $y'(0) = 10$
- D-  $y(0) = 0$  &  $y'(0) = 0$

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- 3- A diver drops from 30 ft above the water (about the height of an Olympic platform dive). What is the diver's velocity at impact?

- A-  $y = -16t^2 + 30, y'(\sqrt{\frac{15}{8}}) \approx -43.8 \text{ ft/s}$
- B-  $y = -32t^2 + 30, y'(\sqrt{\frac{15}{16}}) \approx -43.8 \text{ ft/s}$
- C-  $y = -4.9t^2 + 30, y'(\sqrt{\frac{300}{94}}) \approx -43.8 \text{ ft/s}$
- D-  $y = -9.8t^2 + 30, y'(\sqrt{\frac{150}{49}}) \approx -43.8 \text{ ft/s}$



- 4- A diver drops from 120 ft above the water (about the height of divers at the Acapulco Cliff Diving competition). What is the diver's velocity at impact?

A-

$$y = -32t^2 + 120, y'(\sqrt{\frac{15}{4}}) \approx -87.64 \text{ ft/s}$$

B-

$$y = -16t^2 + 120, y'(\sqrt{\frac{15}{2}}) \approx -87.64 \text{ ft/s}$$

C-

$$y = -4.9t^2 + 120, y'(\sqrt{24.48}) \approx 87.64 \text{ ft/s}$$

D-

$$y = -9.8t^2 + 120, y'(\sqrt{13.48}) \approx 87.64 \text{ ft/s}$$

- 5- The Washington Monument is 555 ft and,  $5\frac{1}{8}$  in high. In a famous experiment, a baseball was dropped from the top of the monument to see if a player could catch it. How fast would the ball be going?

A-  $y = -16t^2 + 555.16, y'(5.86) \approx -93.75 \text{ ft/s}$ . (If you assume the ball is caught at ground level, the ball will be going 94.27 ft/sec.)

B-  $y = 16t^2 - 555.427, y'(5.86) \approx -93.75 \text{ ft/s}$ . (If you assume the ball is caught at ground level, the ball will be going 94.27 ft/sec.)

C-  $y = 16t^2 - 555.16, y'(5.86) \approx -93.75 \text{ ft/s}$ . (If you assume the ball is caught at ground level, the ball will be going 94.27 ft/sec.)

D-  $y = -16t^2 + 555.427, y'(5.86) \approx -93.75 \text{ ft/s}$ . (If you assume the ball is caught at ground level, the ball will be going 94.27 ft/sec.)