

Name:

Date:

Class:

Horizontal Projectile Motion Intro Worksheet **Answer Key**

y-direction:

$$d = v_i t + \frac{1}{2} a t^2$$

x-direction:

$$d = v_i t + \frac{1}{2} a t^2$$

1. A ball is dropped from 4 meters high. How long does it take for the ball to reach the ground?

y-direction:

$$d = v_i t + \frac{1}{2} a t^2$$

$$h = 0 + \frac{1}{2} g t^2$$

$$\sqrt{\frac{2h}{g}} = t$$

$$\sqrt{\frac{2(4)}{9.8}} = t$$
$$\sqrt{0.816} = t$$

$$\boxed{0.90 \text{ s} = t}$$

2. A ball is launched horizontally at 2 m/s from 2 meters high. How long does it take for the ball to reach the ground?

Ignore horizontal velocity.

Initial velocity in the y-direction is zero.

y-direction:

$$d = v_i t + \frac{1}{2} a t^2$$

$$h = 0 + \frac{1}{2} g t^2$$

$$\sqrt{\frac{2h}{g}} = t$$

$$\sqrt{\frac{2(2)}{9.8}} = t$$

$$\sqrt{0.408} = t$$

$$\boxed{0.64 \text{ s} = t}$$

3. A ball is launched horizontally at 2 m/s from 2 meters high. How far away does the ball hit the ground?

Y-direction is the same as the previous problem.

The time it takes to hit the ground is 0.64 s.

x-direction:

$$d = v_i t + \frac{1}{2} a t^2$$

$$d = v_i t + 0$$

$$d = v_i t$$

$$d = 2(0.64)$$

$$\boxed{d = 1.28 \text{ m}}$$