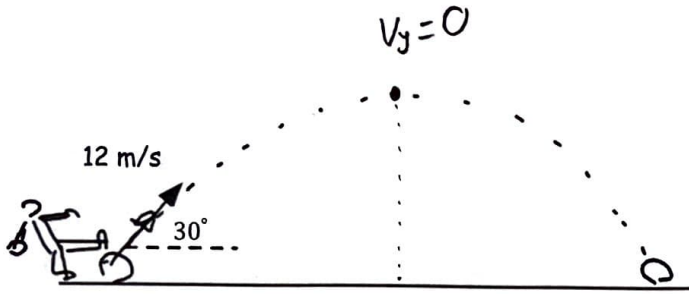


Projectile Motion

Angled Launches A

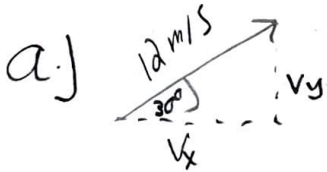
Check-in #5

Name: _____



The soccer ball is kicked from and lands at the same height.

- Solve for V_x and V_y .
- How long was the ball in flight?
- What horizontal distance did the ball travel?
- What was its maximum height above the launch point?



$$V_x = (12 \text{ m/s}) \cos 30 = 10.4 \text{ m/s}$$

$$V_y = (12 \text{ m/s}) \sin 30 = 6 \text{ m/s}$$

b.)

X	Y
$V_{ix} = 10.4 \text{ m/s}$	$V_{iy} = 6 \text{ m/s}$
$a_x = 0$	$a_y = -10 \text{ m/s}^2$
	$V_{fy} = 0 \text{ m/s}$ ← velocity at peak height
	$t = ?$
	d

$$V_f = V_i + at$$

$$0 = 6 + (-10)t$$

$$-6 = -10t$$

$t = 0.6$ seconds to reach peak

DOUBLE IT!

$$t = 1.2 \text{ seconds}$$

c.) 'x' direction

$V_{ix} = 10.4 \text{ m/s}$

$a_x = 0$

$t = 1.2 \text{ seconds}$

$d = ?$

~~V_f~~

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

$$d = (10.4)(1.2)$$

$$d = 12.48 \text{ m}$$

d.) 'y' direction

$V_{iy} = 6 \text{ m/s}$

$V_{fy} = 0 \text{ m/s}$

$a_y = -10 \text{ m/s}^2$

$d = ?$

~~V_f~~

$$V_f^2 = V_i^2 + 2ad$$

$$0 = 6^2 + 2(-10)d$$

$$0 = 36 - 20d$$

$$d = 1.8 \text{ m}$$

Answers at bottom!

Projectile Motion

Check-in #5



The football is thrown from and caught at the same height.

- Solve for V_x and V_y .
- How long was the ball in flight?
- What horizontal distance did the ball travel?
- What was its maximum height above the launch point?

a.) $V_x = 9 \text{ m/s}$
 $V_y = 15.6 \text{ m/s}$

b.) time = 3.1 seconds

c.) $d = 28.1 \text{ m}$

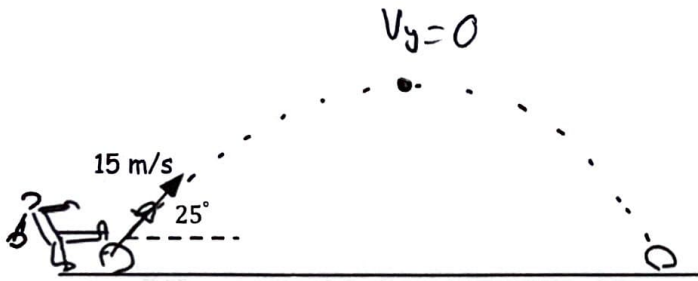
d.) $d = 12.2 \text{ m}$

Projectile Motion

Angled Launches B

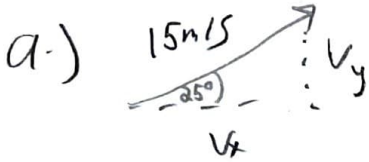
Check-in #5

Name: _____



The soccer ball is kicked from and lands at the same height.

- Solve for V_x and V_y .
- How long was the ball in flight?
- What horizontal distance did the ball travel?
- What was its maximum height above the launch point?



$$V_x = (15 \text{ m/s}) \cos 25 = 13.6 \text{ m/s}$$

$$V_y = (15 \text{ m/s}) \sin 25 = 6.3 \text{ m/s}$$

b.)

x	y
$v_{ix} = 13.6 \text{ m/s}$	$v_{iy} = 6.3 \text{ m/s}$
$a_x = 0$	$a_y = -10 \text{ m/s}^2$
	$v_{fy} = 0 \text{ m/s}$ ← velocity at peak height
	$t = ?$
	$d = ?$

$$V_f = V_i + a t$$

$$0 = (6.3) + (-10) t$$

$$-6.3 = -10 t$$

$t = 0.63$ seconds to reach peak height

DOUBLE IT!

$$t = 1.26 \text{ seconds}$$

c.) 'x' direction

$$v_{ix} = 13.6 \text{ m/s}$$

$$a_x = 0$$

$$t = 1.26 \text{ seconds}$$

$$d = ?$$

$$v_{fx} =$$

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

$$d = (13.6)(1.26)$$

$$d = 17.14 \text{ m}$$

d.) 'y' direction

$$v_{iy} = 6.3 \text{ m/s}$$

$$a = -10 \text{ m/s}^2$$

$$t = 0.63 \text{ seconds}$$

$$d = ?$$

$$v_{fy} =$$

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

$$d = (6.3)(0.63) + \frac{1}{2}(-10)(0.63^2)$$

$$d = 1.98 \text{ m}$$

Answers at bottom

Projectile Motion

Check-in #5



The football is thrown from and caught at the same height.

- Solve for V_x and V_y .
- How long was the ball in flight?
- What horizontal distance did the ball travel?
- What was its maximum height above the launch point?

a.) $V_x = 12 \text{ m/s}$
 $V_y = 17.2 \text{ m/s}$

b.)
 $t = 3.4 \text{ seconds}$

c.)
 $d = 41.3 \text{ m}$

d.)
 $d = 14.8 \text{ m}$