

# Intro to Projectiles


## Self test help

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# River Crossing

- Do as two different Problems
- Both problems take place at a constant speed
- Use the across river time as the down river time

Across

$$V = \frac{\Delta X}{t}$$

$$8.5 = \frac{26.8}{t}$$

Down

$$V = \frac{\Delta X}{t}$$

$$3.8 = \frac{\Delta X}{t}$$

USE time from across river

Angle from X-Axis: 90°

8.5 m/s

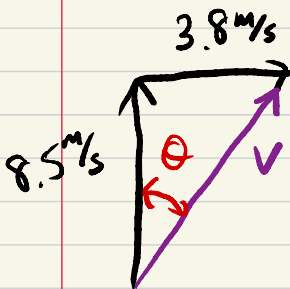
3.8 m/s

26.8 m

X

Based on the speed of the river, the speed of your boat relative to the water, and the distance across the river, determine the downstream distance of your boat when it reaches the opposite shore of the river. The downstream distance refers only to the distance the boat travelled in the x direction while crossing the river.

End



$v$  is total speed

$\theta$  is angle for triangle

$90 - \theta$  is launch angle

# Drone Delivery

- Measure height to bottom of the red ball
- Ball starts moving only horizontally
- After getting  $\Delta x$ , count back that many meters from the target

Enter Answers      Show Question

Horiz	vertical
$\Delta x =$	$\Delta y = -2.5\text{m}$
$v = 2.3\text{m/s}$	$v_i = 0$
$t =$	$v_f =$
	$a = -9.2\text{m/s}^2$
	$t = \uparrow$
	Not on Earth

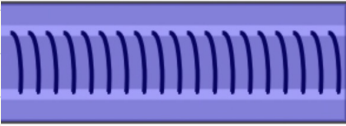
m

# Horizontal Speed

- Click on the zoomed in launcher to fire ball
- Measure  $\Delta x$  to the middle of the ball's landing location
- You are solving for horizontal speed at launch

Enter Answers

Zoomed Image Of Launcher



Horiz.	Vertical
$\Delta x = 3 \text{ m}$	$\Delta y = -.9 \text{ m}$
$v = ?$	$v_i = 0 \text{ m/s}$
$t =$	$v_f =$
	$a = -10.2$
	$t =$

Show Question



# Difference in Landing Location

- Start by finding the distance traveled by the ball on the right
- Add the  $\Delta x$  to the original separation of the steel balls

End

After you have made your calculation, hit the end button.

The projectile launcher shown below will give the object on the right an initial horizontal speed of 6.7 m/s. While the other object will be dropped with no initial speed. The objects are initially 84 cm above the ground and separated by 142 cm. What will be the difference in the landing locations of the two objects?

