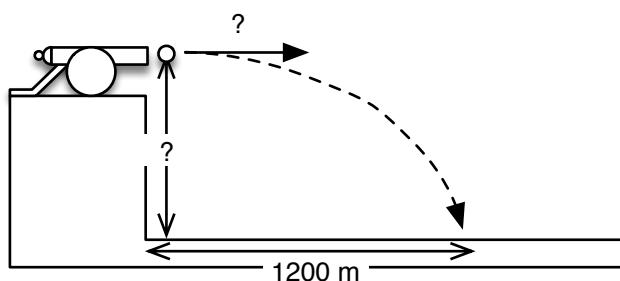# Cycle 17 Projectile Motion

Review

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1. The cannonball is shot horizontally from the height shown. It was in the air for **4 seconds**. It lands as shown.
   a) What was the cannonball's initial height?
   b) What was the cannonball's initial velocity?

2. The baseball is hit from and caught at the same height.
   a) Resolve the initial velocity into components.
   b) How long was the ball in flight?
   c) What horizontal distance did the ball travel?
   d) How high above the start height did the ball get?

A 🏃 10 m/s →

5 m/s ← 🏃 B

3. Both bathers leave the diving board at the same time, from the same height, running horizontally. Assume drag from the air is minimal. What will happen?

(a) A will hit the water first.
(b) B will hit the water first.
(c) They both hit at the same time.
(d) Depends on which one is heavier.
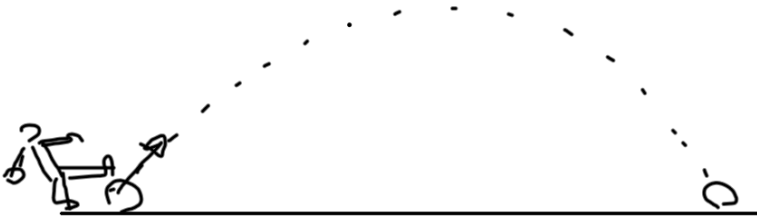
4. The soccer play kicks the ball at 39° and it lands as shown.

    a) Name an angle that would have made the ball go further in the x-direction.

    b) Name an angle that would have made the ball go less far in the x-direction.

    c) Name an angle that would have made the ball land in the exact same spot.

Answers

1. a) 80 m
   b) 300 m/s

2. a) $V_{xo} = 39.0$ m/s; $V_{yo} = 22.5$ m/s
   b) 4.5 s
   c) 175.5 m
   d) 25.3 m

3. c

4. a) Any angle between 39° and 51°.
   b) Any angle less than 39° or greater than 51°
   c) Exactly 51°.