

Cannon Maximum Range

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1 Problem

and it shoots 10-kilogram cannonballs.

Holzner, Steven. Physics I For Dummies (For Dummies (Math & Science)) (p. 113). Wiley. Kindle Edition.

What's the range for your new cannon if you aim it at 45° , which gives you your maximum range? If the cannonball has an initial velocity of 860 meters/second,



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2 Solution

The question we have to

$$a = \frac{\Delta v}{\Delta t}$$
$$-9.8 = \frac{0 - 860 \sin(45)}{t}$$

This is the time it takes to reach the apex. It would then have to travel back down.

$$t = 62 * 2 = 124s$$

$$s = \bar{v}t$$

The cannonball wouldn't magically stop after hitting the ground so we would assume it's final velocity doesn't change.

$$\bar{v} = \frac{v_i + v_f}{2}$$

$$\bar{v} = \frac{860 + 860}{2} = 860$$

$$s = \bar{v}t$$

$$860 * \cos(45) * 124$$

$$s = 75,405m$$