The ranges of the bullets fired from a gun at angle θ, 2θ and 4θ are found in the ratio x : 2 : 2, then the value of x will be (Assume same speed of bullets)

A) 1

B) 2

C)√3

D) none of these.

The total horizontal distance travelled by the projectile equals:

$$d = \frac{v^2 \sin(2\alpha)}{g}$$

g - the gravitational acceleration

α - the angle at which the projectile is launched

v - the velocity at which the projectile is launched

If ratio of the ranges of the bullets fired from a gun at 2θ and 4θ is found in the ratio 2 : 2, then:

$\sin 4\theta = \sin 8\theta$ => $\theta = 15$ ($\sin 60 = \sin 120 = \frac{\sqrt{3}}{2}$)

Range of the bullet fired from a gun at angle θ equals:

$$d = \frac{v^2 \sin(2\theta)}{g} = \frac{v^2 \sin(30)}{g} = \frac{v^2}{2g}$$

Range of the bullet fired from a gun at angle 2θ equals:

$$d = \frac{v^2 \sin(4\theta)}{g} = \frac{v^2 \sin(60)}{g} = \frac{\sqrt{3}v^2}{2g}$$

Ratio of the ranges equals:

$1 : \sqrt{3}$ or $\frac{2}{\sqrt{3}} : 2$

Answer: D) none of these.