

Answer on Question #48392 – Math – Algebra

According to the laws of physics, if a ball travels along a line with slope m and strikes the side of the pool table, it bounces back along a line with slope $-m$.

a. A ball starts at $(2, 6)$ and moves along the line with slope -2 towards the y -axis. Where does it strike the y -axis? What slope does it have after bouncing off the y -axis? Draw the paths on your graph. Give the equations for both parts of the path of the ball.

b. Follow the ball in (a) for two more bounces, drawing the lines on your graph. Give the coordinates of the points where the ball bounces off each side. State the slope of each part of the path. If the ball could move according to these rules forever, would it ever go in a pocket?

Solution.

a. **Green lines.**

Ball strikes the y -axis at $(0, 10)$

Slope after bouncing: 2

Before bouncing: $y = -2x + 10$

After bouncing: $y = 2x + 10$

b. **Red lines**

Ball bounces at $(6,2)$ and $(5,0)$

Slopes: -2 and 2

If the ball could move according to these rules forever, it never go in a pocket. It will moves between points $(0,10)$, $(1,12)$, $(6,2)$ and $(5,0)$.

