Bounce that Ball

Working with Proportionalities

If you have a linear graph with a y-intercept of zero, then this suggests a direct proportionality.

$y \propto x \Rightarrow$ "y is directly proportional to x"

"y varies directly with x"

Consider your bounce that ball data:

$h_b \propto h_d$ (proportionality statement)

$h_b = k h_d$ (general equation – k is called the proportionality constant)

$k = \frac{h_b}{h_d}$

$k = \frac{60\text{cm}}{80\text{cm}}$ ← use a value of h_b and h_d to find k.

$k = 0.75$ ← find "k"

$h_b = 0.75 h_d$ (specific equation)

$(y = mx + b)$

A varies directly with the square of B: $A \propto B^2$

F varies directly with the square of v and inversely with r.

$$F \propto \frac{v^2}{r}$$

2. $P \propto d^2$ (proportionality statement)

$P = kd^2$ (general equation)

$k = \frac{P}{d^2}$

$k = \frac{8.25}{(10)^2}$

$k = 0.0825$ (proportionality constant)

$P = 0.0825d^2$ (specific equation)

$P = 0.0825(16)^2$

$P = \$21.12$ ($21 for sd)