

Chapter 2 Even Problem Solutions

- #16. First we find out how fast the kid brother can run. We ask the question, what speed x is 9.0m/s 120% of?

$$9.0 \frac{m}{s} = 1.2x \implies x = \frac{9.0 \frac{m}{s}}{1.2} = 7.5 \frac{m}{s}$$

Now we ask, how fast can I run 100m?

$$\frac{100m}{9.0 \frac{m}{s}} = 11s$$

How fast can my kid brother run 100m?

$$\frac{100m}{7.5 \frac{m}{s}} = 13s$$

Therefore, I should give my kid brother a 2 second head start to have a tie race.

- #60. The displacement of the rock downwards as a function of time is:

$$y = \frac{1}{2}gt^2$$

The distance to the water at the bottom of the well is the displacement of the rock after 4.4s of travel, therefore:

$$y = \frac{1}{2} * 9.8 \frac{m}{s^2} * (4.4s)^2 = 95m$$