7.7 Applications of Rational Expressions

$*V=\pi r^2 h$

Example #1:
A tomato soup can has a volume of 350 cm^3 and a base radius of 3.4 cm. The company plans to redesign the can with a larger base but having the same volume as the original can.

a) Calculate the height of the original can

$350 = \pi \cdot (3.4)^2 \cdot h$

$\frac{350}{\pi \cdot (3.4)^2} = h$

9.64cm

b) Suppose you know the increase in the base radius. determine a formula to calcualte the decrease in the height.

$V=\pi r^2 h$

Decrease Height = Orgnial height − New Height

$D = 9.64 - \frac{350}{\pi \cdot (3.4+x)^2}$

c) What is the decrease in height for each increase in radius.

i) 0.2 cm ii) 0.4 cm

$9.64 - \frac{350}{\pi \cdot (3.4+0.2)^2}$

1.04cm

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Example #2:
$d=v \cdot t$

Jim swims at an average speed of 5 km/h in still water. Everyday he swims 100m downstream and back.

a) Suppose the current is "x" km/h. Determine a formula for his total time in hours.

$t=\frac{d}{v}$ Total Time = Time Upstream + Time Downstream

$T = \frac{.100}{(5-x)} + \frac{.100}{(5+x)}$

b) Calculate the time, in seconds, for a round trip for each current speed:

i) 2 km/h ii) 3 km/h

$\frac{.100}{(5-2)} + \frac{.100}{(5+2)}$ $\frac{.100}{(5-3)} + \frac{.100}{(5+3)}$

0.0476 hrs × 60 = 2.86 min × 60 = 171 sec.

0.0625 hrs. 3.75 min 225 sec.

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