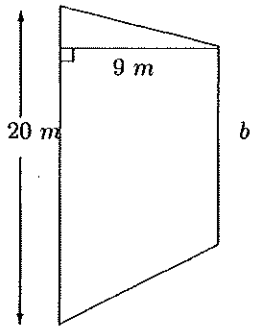
Key

Math 118 - Dr. Miller - Quiz #5: More about Area - **Due Monday, 02/17/14**

1. Show work in finding the missing value, to the nearest tenth: $A = 240\ m^2, b = ??$



$A = \frac{1}{2}(b_1 + b_2)\cdot h$

$240 = \frac{1}{2}(20 + b)\cdot 9$

algebra work #1

algebra work #2

+ many other algebraic variations

$480 = (20 + b)\cdot 9$

$480 = 180 + 9b$

$300 = 9b$

$\boxed{33.3\ m = b}$

$240 = 4.5(20 + b)$

$240 = 90 + 4.5b$

$150 = 4.5b$

$\boxed{33.3\ m = b}$

2. If the area of a circle doubles, in what way has its radius changed? Be specific about the amount and nature of the change; show support through 2 pairs of comparisons.

old

$A = 1 \rightarrow 1 = \pi r^2$

$\frac{1}{\pi} = r^2$

$.32 = r^2$

$\sqrt{.32} = r$

$.56 = r$

new

$A = 2 \rightarrow 2 = \pi r^2$

$\frac{2}{\pi} = r^2$

$.64 = r^2$

$\sqrt{.64} = r$

$.8 = r$

new r vs old r: $.8 - .56 = .24$ added

$.8 \div .56 = 1.4$ times more

old

$A = 50 \rightarrow 50 = \pi r^2$

$\frac{50}{\pi} = r^2$

$15.9 = r^2$

$4.0 = r$

new

$A = 100 \rightarrow 100 = \pi r^2$

$31.8 = r^2$

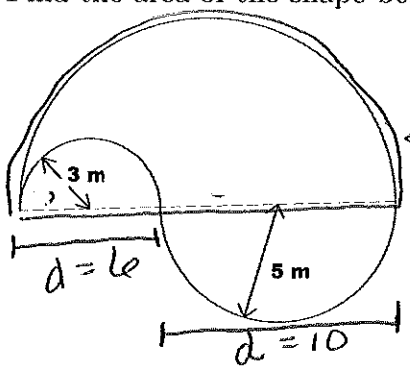
$5.6 = r$

new vs old: 1.6 added

or $5.6 \div 4 = 1.4$ times more

$\boxed{\text{The radius gets 1.4 times bigger.}}$

3. Find the area of the shape below. Show clear work.



Total area = area of biggest (outlined) + area of medium − area of little

$= 100.6 + 39.3 - 14.2$

$= 125.7\ m^2$

Biggest semicircle: diameter of smaller circles are double their radii.

diameter of biggest circle = 16, + r = 8

$A_{\odot\ whole} = \pi r^2 = \pi \cdot 8^2 = 201.1 \xrightarrow[\times \frac{1}{2}]{} 100.6$

Medium semicircle: $A_{\odot\ whole} = \pi r^2 = \pi \cdot 5^2 = 78.5 \xrightarrow[\times \frac{1}{2}]{} 39.3$

Small semicircle: $A_{\odot\ whole} = \pi r^2 = \pi \cdot 3^2 = 28.3 \xrightarrow[\times \frac{1}{2}]{} 14.2$

4. Finish our "experiment" from class: find the dimensions of two rectangles whose areas are equal but where the perimeter of one is 10 more than that of the other.

Guess + check; many answers are possible.

One is a 1×12 rectangle 1 12 $\boxed{A=12,\ P=26}$

vs. a 2×6 rectangle 2 6 $\boxed{A=12,\ P=16}$.