Right Triangles – Geometric Mean

Homework Section 8.3 Name_____

Find the geometric mean between each pair of numbers. Give exact answers.

#1) 5 and 3

$x^2 = 5(3)$

$x = \pm\sqrt{5(3)}$

$x = \sqrt{15}$

#2) 4 and 6

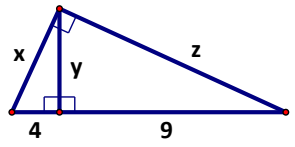
$x^2 = 4(6)$

$x = \pm\sqrt{2\cdot2\cdot2\cdot3}$

$x = 2\sqrt{6}$

Find the missing values. (If not a whole number, leave it in simplest radical form)

#3) $(x, y, z) =$ ($2\sqrt{13}$, 6, $3\sqrt{13}$)



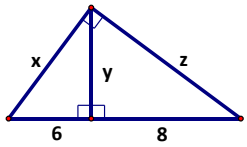
$x^2 = 4(13)$ | $y^2 = 4(9)$ | $z^2 = 9(13)$

$x = \pm\sqrt{4(13)}$ | $y = \pm\sqrt{4(9)}$ | $z = \pm\sqrt{9\cdot13}$

$x = 2\sqrt{13}$ | $y = 2\cdot3$ | $z = 3\sqrt{13}$

$y = 6$

#4) $(x, y, z) =$ ($2\sqrt{21}$, $4\sqrt{3}$, $4\sqrt{7}$)



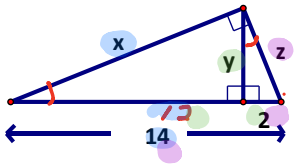
$x^2 = 6(14)$ | $y^2 = 6(8)$ | $z^2 = 8(14)$

$x = \pm\sqrt{3\cdot2\cdot7}$ | $y = \pm\sqrt{3\cdot2\cdot2\cdot2\cdot2}$ | $z = \pm\sqrt{2\cdot2\cdot2\cdot7}$

$x = 2\sqrt{21}$ | $y = 2\cdot2\sqrt{3}$ | $z = 2\cdot2\sqrt{7}$

$y = 4\sqrt{3}$ | $z = 4\sqrt{7}$

#5) $(x, y, z) =$ ($2\sqrt{42}$, $2\sqrt{6}$, $2\sqrt{7}$)



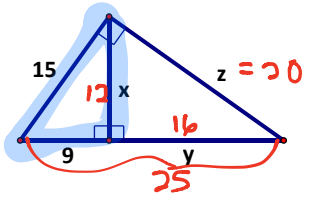
$x^2 = 12(14)$ | $y^2 = 12(2)$ | $z^2 = 2(14)$

$x = \pm\sqrt{3\cdot2\cdot2\cdot2\cdot7}$ | $y = \pm\sqrt{3\cdot4\cdot2}$ | $z = \pm\sqrt{2\cdot2\cdot7}$

$x = 2\sqrt{42}$ | $y = 2\sqrt{6}$ | $z = 2\sqrt{7}$

Round to two decimal places if needed.

#6) $(x, y, z) =$ (12, 16, 20)



Pyth Triple 9-12-15 | $(12)^2 = 9y$ | Pythag Triple 15-20-25

$\therefore x = 12$ | $144 = 9y$ | $\therefore z = 20$

$16 = y$

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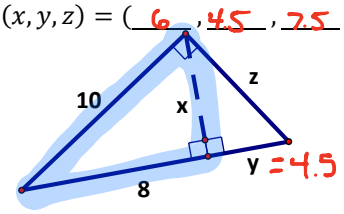
#7) $(x, y, z) = (\underline{6}, \underline{4.5}, \underline{7.5})$

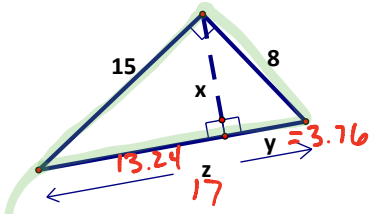


$(10)^2 = 8(y+8)$
$100 = 8y + 64$
$36 = 8y$
$4.5 = y$

Pythag. Triple
6-8-10
$x = 6$

$z^2 = 4.5(12.5)$
$z^2 = 56.25$
$z = \pm\sqrt{56.25}$
$z = 7.5$

#8) $(x, y, z) = (\underline{7.06}, \underline{3.76}, \underline{17})$



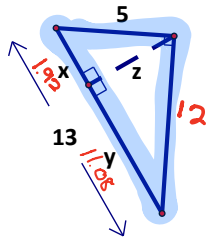
$17 - 3.76 = 13.24$

Pythagorean Triple
8-15-17

$(8)^2 = y(17)$
$64 = y(17)$
$3.76 \approx y$

$x^2 = 3.76(13.24)$
$x^2 = 49.7824$
$x \approx \pm 7.06$

#9) $(x, y, z) = (\underline{1.92}, \underline{11.08}, \underline{4.61})$



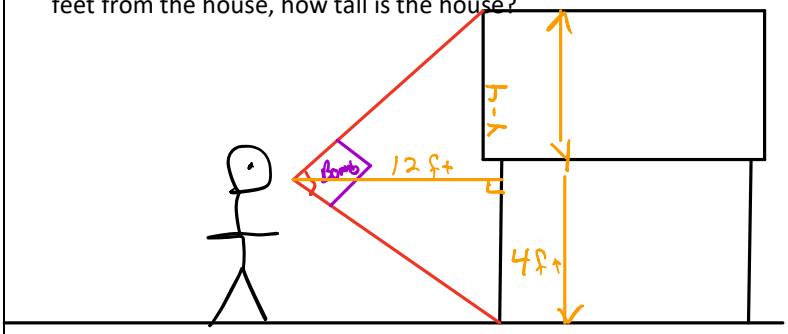
Pythag Triple
5-12-13

$(5)^2 = x(13)$
$25 = 13x$
$1.92 \approx x$

$1.92 + y = 13$
$y = 11.08$

$z^2 = (1.92)(11.08)$
$z^2 = 21.2736$
$z = \pm 4.61$

#10) The find the height his house, George held the corner of a box of Sugar Bombs near his eye so that the top and bottom of the house were in line with two edges of the box. If George's eye is 4 feet off the ground and he is standing 12 feet from the house, how tall is the house?



$12^2 = 4(y-4)$
$144 = 4(y-4)$
$36 = y-4$
$40 = y$

The house is 40 feet tall.