Name: Key

Period: _____ Date: _____

Geometry Worksheet

7.4 Right Triangles with an Altitude

I. Simplify each radical.

1) $\sqrt{144}$ = 12

2) $\sqrt{150}$ = $5\sqrt{6}$

3) $\sqrt{\frac{81}{100}}$ = $9/10$

4) $\frac{\sqrt{98}}{\sqrt{25}}$ = $\frac{7\sqrt{2}}{5}$

5) $\frac{\sqrt{121}}{\sqrt{25}}$ = $\frac{11}{5}$

6) $\frac{\sqrt{98}}{\sqrt{32}}$ = $\frac{7\sqrt{2}}{4\sqrt{2}} = \boxed{7/4}$

II. Find the geometric mean for each pair of numbers.

1) 7 and 9 $3\sqrt{7}$

$\frac{7}{x} = \frac{x}{9}$ $x^2 = 63$

2) 14 and 14 14

$\frac{14}{x} = \frac{x}{14}$

3) $2\sqrt{3}$ *and* $\sqrt{3}$ $\sqrt{6}$

$\frac{2\sqrt{3}}{x} = \frac{x}{\sqrt{3}}$ $x^2 = 6$

4) $8\sqrt{2}$ *and* $\sqrt{2}$ 4

$\frac{8\sqrt{2}}{x} = \frac{x}{\sqrt{2}}$ $x^2 = 16$

5) 10 and 8.1 9

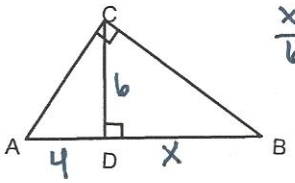
$\frac{10}{x} = \frac{x}{8.1}$ $x^2 = 81$

6) $\frac{9}{16}$ *and* $\frac{25}{36}$ $5/8$

$\frac{\frac{9}{16}}{x} = \frac{x}{\frac{25}{36}}$ $x^2 = \frac{25}{64}$

III. Use the figures to answer #1-7.

1) Find DB if AD = 4 and CD = 6. 9

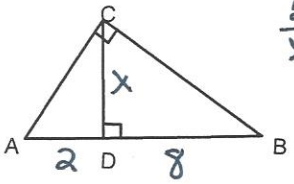


$\frac{x}{6} = \frac{6}{4}$

$4x = 36$

$x = 9$

2) If AD = 2 and DB = 8, find CD. 4

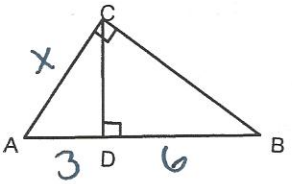


$\frac{2}{x} = \frac{x}{8}$

$x^2 = 16$

$x = 4$

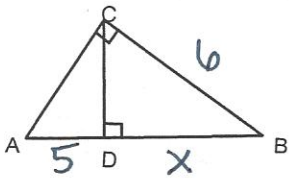
3) If AD = 3 and DB = 6, find AC. $3\sqrt{3}$



$\frac{3}{x} = \frac{x}{9}$ $x = 3\sqrt{3}$

$x^2 = 27$

4) Find DB if BC = 6 and AD = 5. 4



$\frac{x}{6} = \frac{6}{x+5}$

$x^2 + 5x = 36$

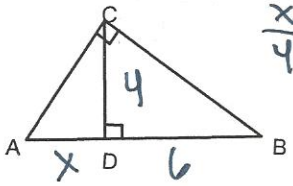
$x^2 + 5x - 36 = 0$

$(x+9)(x-4) = 0$

$\cancel{x = -9}$ $x = 4$

gives neg. length

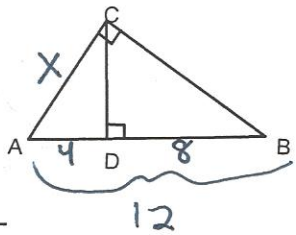
5) Find AD if DC = 4 and DB = 6. $8/3$



$\frac{x}{4} = \frac{4}{6}$ $x = \frac{16}{6} = \frac{8}{3}$

$6x = 16$

6) If AB = 12 and DB = 8, find AC. $4\sqrt{3}$

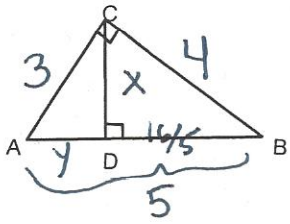


$\frac{4}{x} = \frac{x}{12}$

$x^2 = 48$

$x = 4\sqrt{3}$

7) Find CD if AC = 3, BC = 4 and AB = 5. $12/5$



$\frac{y}{3} = \frac{3}{5}$

$5y = 9$

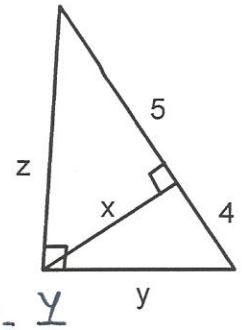
$y = 9/5$

$\frac{9/5}{x} = \frac{x}{16/5}$

$x^2 = \frac{144}{25}$

IV. Find each indicated variable.

8) x = $2\sqrt{5}$
y = 6
z = $3\sqrt{5}$



$\frac{5}{x} = \frac{x}{4}$ $\quad \frac{5}{z} = \frac{z}{9}$

$x^2 = 20$ $\quad z^2 = 45$

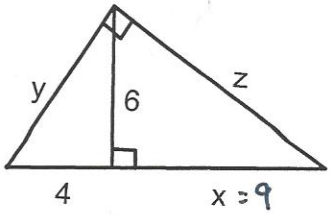
$x = 2\sqrt{5}$ $\quad z = 3\sqrt{5}$

$\frac{4}{y} = \frac{y}{9}$

$y^2 = 36$

$y = 6$

9) x = 9
y = $2\sqrt{13}$
z = $3\sqrt{13}$

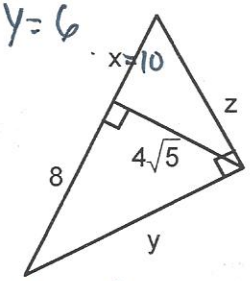


$\frac{4}{6} = \frac{6}{x}$ $\quad \frac{4}{y} = \frac{y}{13}$ $\quad \frac{9}{z} = \frac{z}{13}$

$4x = 36$ $\quad y^2 = 52$ $\quad z^2 = 117$

$x = 9$ $\quad y = 2\sqrt{13}$ $\quad z = 3\sqrt{13}$

10) x = 10
y = 12
z = $6\sqrt{5}$

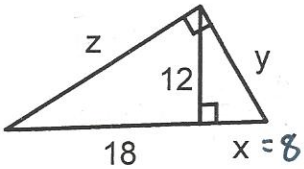


$\frac{x}{4\sqrt{5}} = \frac{4\sqrt{5}}{8}$ $\quad \frac{10}{z} = \frac{z}{18}$ $\quad \frac{8}{y} = \frac{y}{18}$

$8x = 80$ $\quad z^2 = 180$ $\quad y^2 = 144$

$x = 10$ $\quad z = 6\sqrt{5}$ $\quad y = 12$

11) x = 8
y = $4\sqrt{13}$
z = $6\sqrt{13}$

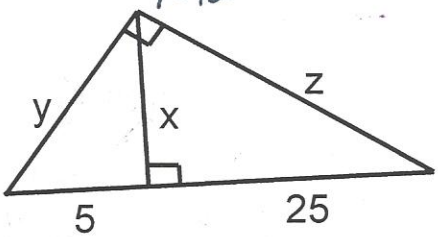


$\frac{18}{12} = \frac{12}{x}$ $\quad \frac{8}{y} = \frac{y}{26}$ $\quad \frac{18}{z} = \frac{z}{26}$

$18x = 144$ $\quad y^2 = 208$ $\quad z^2 = 468$

$x = 8$ $\quad y = 4\sqrt{13}$ $\quad z = 6\sqrt{13}$

12) x = $5\sqrt{5}$
y = $5\sqrt{6}$
z = $5\sqrt{30}$

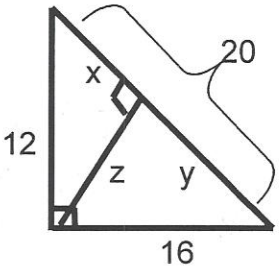


$\frac{5}{x} = \frac{x}{25}$ $\quad \frac{5}{y} = \frac{y}{30}$ $\quad \frac{25}{z} = \frac{z}{30}$

$x^2 = 125$ $\quad y^2 = 150$ $\quad z^2 = 750$

$x = 5\sqrt{5}$ $\quad y = 5\sqrt{6}$ $\quad z = 5\sqrt{30}$

13) x = 7.2
y = 12.8
z = 9.6



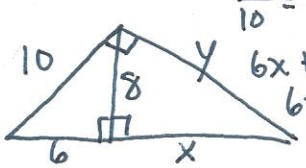
$\frac{x}{12} = \frac{12}{20}$ $\quad \frac{7.2}{z} = \frac{z}{12.8}$

$20x = 144$ $\quad z^2 = 92.16$

$x = 7.2$ $\quad z = 9.6$

14) A right triangle has an altitude of 8 m. and a leg length of 10 m. Find the length of its hypotenuse and the length of the other leg.

hypot. = 50/3
leg = 40/3



$\frac{6}{10} = \frac{10}{x+6}$

$6x + 36 = 100$

$6x = 64$

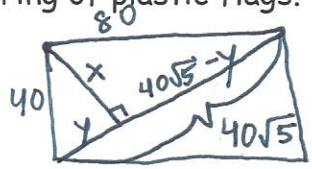
$x = 32/3$

$y^2 + 10^2 = \left(\frac{50}{3}\right)^2$

$y = 40/3$

15) A swimmer is sitting at a corner of an 80 ft. by 40 ft. pool. Stretched diagonally across the pool opposite the swimmer is a string of plastic flags. How far must the swimmer swim to reach the string of plastic flags?

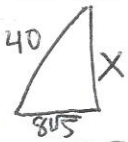
$16\sqrt{5}$ ft



$\frac{y}{40} = \frac{40}{40\sqrt{5}}$

$40\sqrt{5}\, y = 1600$

$y = \frac{40}{\sqrt{5}} = \frac{40\sqrt{5}}{5} = 8\sqrt{5}$



$(8\sqrt{5})^2 + x^2 = 40^2$

$x^2 = 1280$

$x = 16\sqrt{5}$