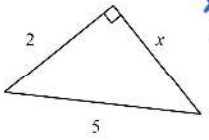
Formal Geometry **Name**_____

8.2 Day 2 Worksheet

***Do all work on your own paper!**

For #1 – 6: Solve for the variable. Use exact answers only (no decimals).

1)



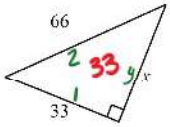
$x^2+2^2=5^2$

$x^2+4=25$

$x^2=21$

$x=\sqrt{21}$

2)



$y^2+1^2=2^2$

$y^2+1=4$

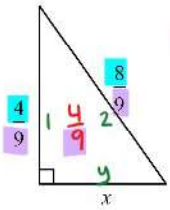
$y^2=3$

$y=\sqrt{3}$

$x=33\cdot\sqrt{3}$

$x=33\sqrt{3}$

3)



$1^2+y^2=2^2$

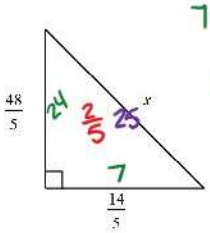
$y^2=3$

$y=\sqrt{3}$

$x=\frac{4}{9}\cdot\sqrt{3}$

$x=\frac{4\sqrt{3}}{9}$

4)

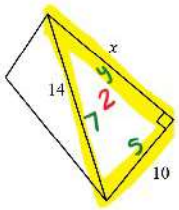


7-24-25 Triple

$x=\frac{5}{25}\cdot\frac{2}{5}$

$x=10$

5)



$5^2+y^2=7^2$

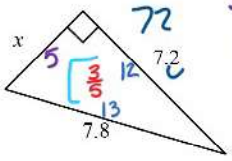
$25+y^2=49$

$y^2=24$

$y=\sqrt{24}<\frac{4}{6}=2\sqrt{6}$

$x=2\cdot2\sqrt{6}=4\sqrt{6}$

6)



5-12-13 Triple

$x=5\cdot\frac{3}{5}$

$x=3$

For 7 – 9: Three side lengths are given below. Determine if these sides would create a right triangle, an acute triangle, an obtuse triangle, or if they would not form a real triangle.

7) $\sqrt{20}, 20, 18$ (a c b)

$a^2=20$ $b^2=324$ $c^2=400$

$20+324 \stackrel{?}{>} 400$

$344<400$

obtuse

8) 7.6, 4.2, 6.4 (c a b)

$a^2=17.64$ $b^2=40.96$ $c^2=57.76$

$17.64+40.96 \stackrel{?}{>} 57.76$

$58.6>57.76$

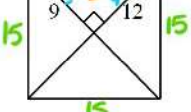
acute

9) 10, 12, 23

$10+12=22$ $22<23$

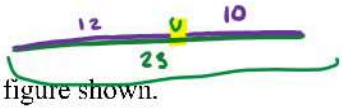
Not a real Δ

10) Find the perimeter of the square shown.

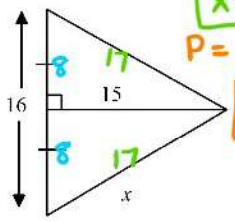


$3\cdot5=15$

$P=15+15+15+15=60$ units



11) Find x and the perimeter of the figure.

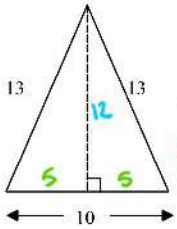


$x=17$

$P=16+17+17$

$P=50$ units

12) Find the area of the figure shown.

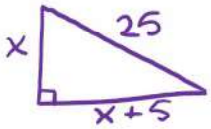


$A=\frac{1}{2}b\cdot h$

$A=\frac{1}{2}10\cdot12$

$A=60u^2$

13) The sides of a triangle have lengths $x, x+5$, and 25. If the length of the longest side is 25, then find the value of x that would make the triangle a right triangle.



$x^2+(x+5)^2=25^2$

$x^2+x^2+10x+25=625$

$2x^2+10x-600=0$

$(2x-30)(x+20)=0$

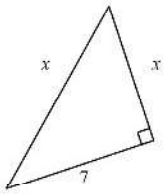
$-30x$ $+40x$ $10x$ ✓

$x=-20, 15$

$x=15$

For #14 – 15, find x.

14)



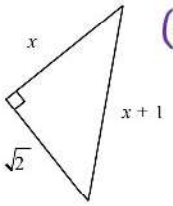
$(x-4)^2 + 7^2 = x^2$

$x^2 - 8x + 16 + 49 = x^2$

$65 = 8x$

$x = \frac{65}{8}$

15)



$(\sqrt{2})^2 + x^2 = (x+1)^2$

$2 + x^2 = x^2 + 2x + 1$

$1 = 2x$

$x = 1/2$

16) M is the midpoint of PQ in rectangle PQRS. Find the perimeter of ΔMST. Exact answers only.

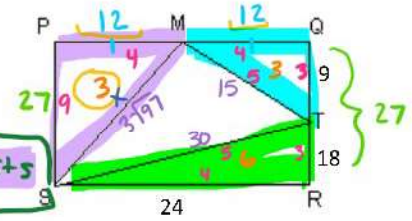
$4^2 + 9^2 = x^2$

$16 + 81 = x^2$

$97 = x^2$

$x = \sqrt{97}$

$P = 30 + 15 + 3\sqrt{97} = 45 + 3\sqrt{97}$ units



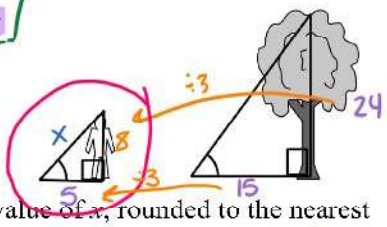
17) A tree has a height of 24 feet, and a shadow that is 15 feet long. At the exact same time of day, when Andy stands next to the tree, his shadow is 5 feet long. Find the distance from the top of Andy's head to the end of his shadow, rounded to the nearest hundredth of a foot.

$5^2 + 8^2 = x^2$

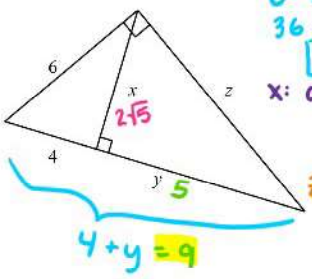
$25 + 64 = x^2$

$89 = x^2$

$x = \sqrt{89} \approx 9.43$ ft



18) Find the value of x, y, and z. Exact answers only.



y first: leg² = closest part · hyp

$6^2 = 4(4+y)$

$36 = 16 + 4y$

$y = 5$

x: alt² = part · part

$x^2 = 4 \cdot 5$

$x = \sqrt{20} \Rightarrow x = 2\sqrt{5}$

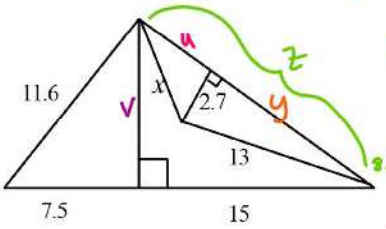
z: leg² = closest part · hyp.

$z^2 = 5 \cdot 9$

$z = \sqrt{45} \Rightarrow z = 3\sqrt{5}$

$4 + y = 9$

19) Find the value of x, rounded to the nearest tenth.



$y^2 + 2.7^2 = 13^2$

$y = \sqrt{161.71}$

$y = 12.7165$

$v^2 + 7.5^2 = 11.6^2$

$v = \sqrt{78.31}$

$v = 8.8493$

$8.8493^2 + 15^2 = z^2$

$\sqrt{303.3101} = z$

$z = 17.4158$

$u = z - y$

$u = 17.4158 - 12.7165$

$u = 4.6993$

$x^2 = 2.7^2 + u^2$

$x^2 = 2.7^2 + (4.6993)^2$

$x = \sqrt{29.3734}$

$x \approx 5.4$

20) Solve for x: $20x^2 + 2x - 4 = 5x^2 + 15x + 2$

$-5x^2 \quad -15x \quad -2 \quad -5x^2 \quad -15x \quad -2$

$15x^2 - 13x - 6 = 0$

$(5x - 6)(3x + 1) = 0$

$5x - 6 = 0 \Rightarrow x = 6/5$ or

$3x + 1 = 0 \Rightarrow x = -1/3$

Answers:

1) $\sqrt{21}$ 2) $33\sqrt{3}$ 3) $\frac{4\sqrt{3}}{9}$ 4) 10 5) $4\sqrt{6}$ 6) 3 7) obtuse

8) acute 9) not a real triangle 10) 60 units 11) $x = 17$; per $= 50$ units 12) 60 u^2 13) 15

14) $\frac{65}{8}$ 15) $\frac{1}{2}$ 16) $45 + 3\sqrt{97}$ 17) 9.43 ft 18) $x = 2\sqrt{5}; y = 5; z = 3\sqrt{5}$

19) 5.4 20) $x = \frac{6}{5}; -\frac{1}{3}$