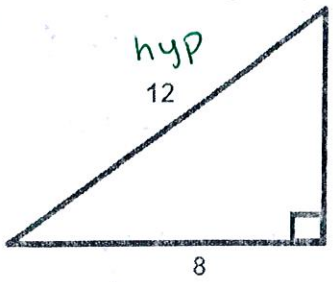
Name: _____ Date: _____ **Unit 3 Quiz Practice**

I. Pythagorean Theorem

1. Find the missing side.



$(8)^2 + (y)^2 = (12)^2$

$64 + y^2 = 144$

$-64 \qquad -64$

$\sqrt{y^2} = \sqrt{80}$

$\boxed{y = \sqrt{80} \text{ OR } 4\sqrt{5}}$

2. In a right triangle, the length of a hypotenuse is 19 and the length of one leg is $\sqrt{5}$. What is the length of the other leg is?

$(\sqrt{5})^2 + (b^2) = (19)^2$

$5 + b^2 = 361$

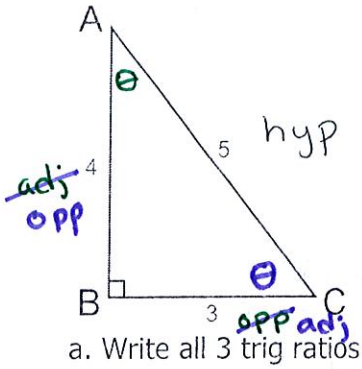
$-5 \qquad -5$

$\sqrt{b^2} = \sqrt{356}$

$\boxed{b = \sqrt{356} \text{ OR } 2\sqrt{89}}$

II. Trig Ratios

3.



a. Write all 3 trig ratios for Angle A.

$\sin(A) = \frac{3}{5} \quad \cos(A) = \frac{4}{5}$

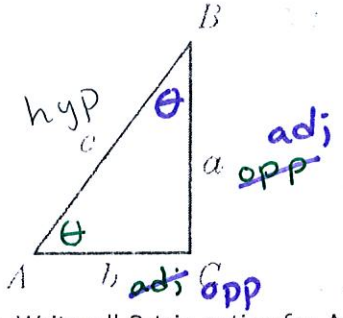
$\tan(A) = \frac{3}{4}$

b. Write all 3 trig ratios for Angle C.

$\sin(c) = \frac{4}{5} \quad \cos(c) = \frac{3}{5}$

$\tan(c) = \frac{4}{3}$

4.



a. Write all 3 trig ratios for Angle A (use the variables).

$\sin(A) = \frac{a}{c} \quad \cos(A) = \frac{b}{c}$

$\tan(A) = \frac{a}{b}$

b. Write all 3 trig ratios for Angle B (use the variables).

$\sin(B) = \frac{b}{c} \quad \cos(B) = \frac{a}{c}$

$\tan(B) = \frac{b}{a}$

5. Write an equivalent co-function for the following functions below:

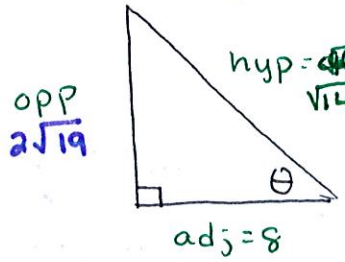
a. sin(30) $\quad \cos(90-30)$ $\quad \boxed{\cos(60)}$

b. cos(70) $\quad \sin(90-70)$ $\quad \boxed{\sin(20)}$

c. tan(20) $\quad \frac{1}{\tan(90-20)} \rightarrow \boxed{\frac{1}{\tan(70)}}$

d. sin(56) $\quad \cos(90-56)$ $\quad \boxed{\cos(34)}$

6. If the $\cos(\theta) = \frac{8}{\sqrt{140}}$ (adj / hyp), find the $\tan(\theta)$.



$(8)^2 + b^2 = (\sqrt{140})^2$

$64 + b^2 = 140$

$-64 \qquad -64$

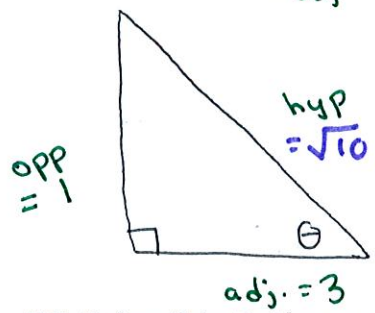
$\sqrt{b^2} = \sqrt{76}$

$b = \sqrt{76}$ OR $2\sqrt{19}$

$\boxed{\tan(\theta) = \frac{2\sqrt{19}}{8}}$

7. If the $\tan(\theta) = \frac{1}{3}$, find the $\sin(\theta)$.

opp / adj



$(1)^2 + (3)^2 = c^2$

$1 + 9 = c^2$

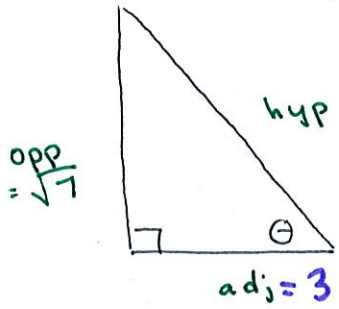
$\sqrt{10} = \sqrt{c^2}$

$\sqrt{10} = c$

$\boxed{\sin(\theta) = \frac{1}{\sqrt{10}}}$

8. If the $\sin(\theta) = \frac{\sqrt{7}}{4}$, find the $\cos(\theta)$.

opp / hyp



$(\sqrt{7})^2 + b^2 = (4)^2$

$7 + b^2 = 16$

$-7 \qquad -7$

$\sqrt{b^2} = \sqrt{9}$

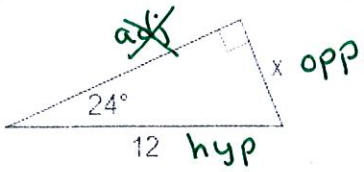
$b = 3$

$\boxed{\cos(\theta) = \frac{3}{4}}$

III. Using Trig Ratios

Use the correct trig ratio to solve for a side or an angle.

9.

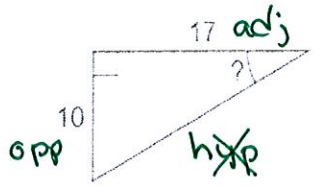


$\frac{\sin(24)}{1} = \frac{x}{12}$

$x = 12\sin(24)$

$\boxed{x = 4.88}$

10.

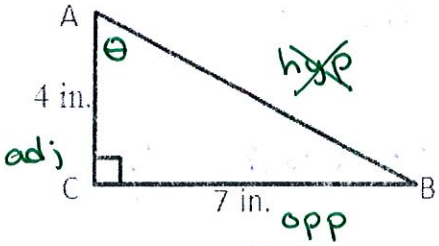


$\tan(\theta) = \frac{10}{17}$

$\theta = \tan^{-1}\left(\frac{10}{17}\right)$

$\boxed{\theta = 30.47°}$

11. Solve for Angle A.

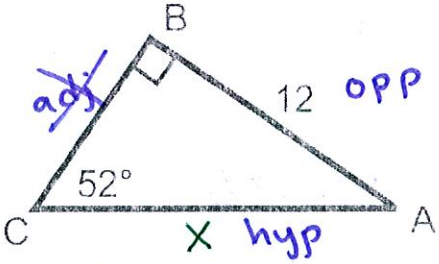


$\tan(A) = \frac{7}{4}$

$A = \tan^{-1}\left(\frac{7}{4}\right)$

$\boxed{A = 60.26°}$

12. If BA = 12, $\angle C = 52°$, what is side CA?

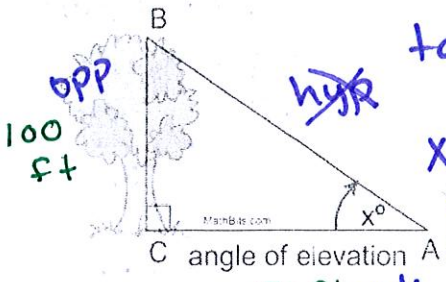


$\frac{\sin(52)}{1} = \frac{12}{x}$

$\frac{12}{\sin(52)} = \frac{\sin(52)x}{\sin(52)}$

$\boxed{x = 15.23}$

13. If the tree is 100 ft tall and the person is 50 ft away from the base of the tree, what is the angle of elevation?

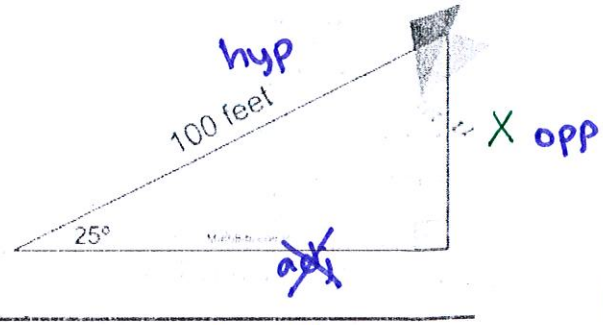


$\tan(x) = \frac{100}{50}$

$x = \tan^{-1}\left(\frac{100}{50}\right)$

$\boxed{x = 63.43°}$

14. How high is the kite from the ground?



$\frac{\sin(25)}{1} = \frac{x}{100}$

$x = 100\sin(25)$

$\boxed{x = 42.26 \text{ ft}}$