

Name: Answer key Per: \_\_\_\_\_ Date: 9/16  
 Serafino • Precalculus

## 1-R Right Triangles Review

Simplifying Radicals, Special Right Triangles,  
 Pythagorean Theorem, Trig Functions, Right Triangle Trig

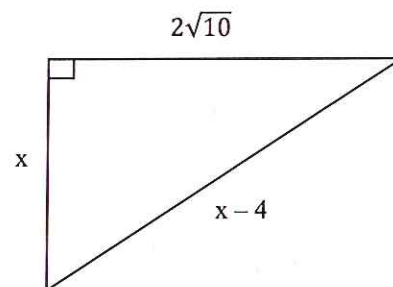


**PART 1: NON-CALCULATOR** – Show all work neatly to ensure full credit!

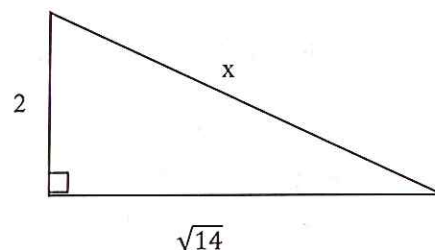
Find the value of  $x$  of the right triangle. Give an exact, simplified answer.

1.  $x = \boxed{\text{no solution}}$   $x^2 + (2\sqrt{10})^2 = (x-4)^2$   
 $x^2 + 40 = x^2 - 8x + 16$   
 $24 = -8x$   
 $x = -3$

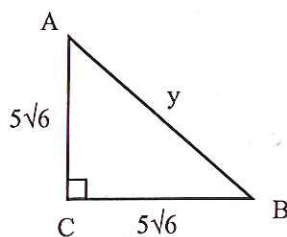
\* How could we have seen that coming?



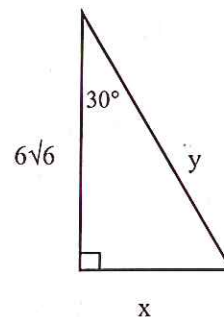
2.  $x = \boxed{3\sqrt{2}}$   $2^2 + 14 = x^2$   
 $4 + 14 = x^2$   
 $\sqrt{x^2} = \sqrt{18}$   
 $x = 3\sqrt{2}$



3.



4.



a)  $y = \frac{5\sqrt{2}}{4 \cdot 3} \boxed{10\sqrt{3}}$

a)  $x = \boxed{6\sqrt{2}}$

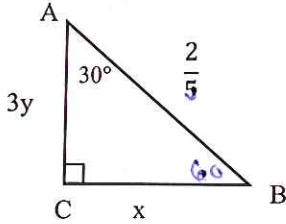
b)  $\tan B = \boxed{1}$

b)  $y = \boxed{12\sqrt{2}}$

c)  $\sin A = \frac{5\sqrt{6} \cdot \sqrt{3}}{2 \cdot 10 \cdot \sqrt{3} \cdot \sqrt{3}} = \frac{\sqrt{18}}{6} = \frac{3\sqrt{2}}{6}$   
 $= \boxed{\frac{\sqrt{2}}{2}}$

c)  $\cos 30 = \frac{6\sqrt{6}}{12\sqrt{2}} = \boxed{\frac{\sqrt{3}}{2}}$

5.



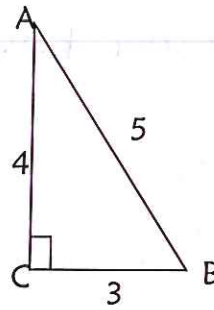
a)  $x = \frac{2}{\sqrt{2}} = \frac{1}{\sqrt{2}}$

b)  $y = \frac{\sqrt{3}}{15}$

c)  $\sin A = \frac{1}{2}$

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

6.

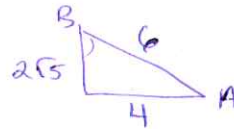


a)  $\sec A = \frac{5}{4}$

b)  $\cot B = \frac{3}{4}$

c)  $\cot A = \frac{4}{3}$

7. Given  $\triangle ABC$ ,  $C = 90^\circ$ ,  $a = 2\sqrt{5}$ , and  $c = 6$ ,



$\sqrt{36 - 20}$   
 $b = 4$

a.  $\cos B$

$\frac{2\sqrt{5}}{6} = \frac{\sqrt{5}}{3}$

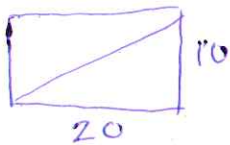
b)  $\cot B$

$\frac{2\sqrt{5}}{4} = \frac{\sqrt{5}}{2}$

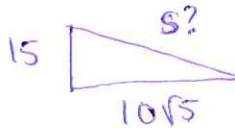
c)  $\csc A$

$\frac{3 \cdot 6 \cdot \sqrt{5}}{2\sqrt{5} \cdot 5} = \frac{3\sqrt{5}}{5}$

8. I want to send my brother a care package. The largest box I can afford to ship is 10 w x 20 l x 15 h in. If I want to send him a giant sandwich, what is the longest length the sandwich can be?



$\sqrt{10^2 + 20^2}$   
 $\sqrt{500}$   
 $10\sqrt{5}$



$(10\sqrt{5})^2 + 15^2 = x^2$   
 $500 + 225 = x^2$   
 $x^2 = \sqrt{725}$   
 $x = \sqrt{725} = 5\sqrt{29}$

$5\sqrt{29}$  or 26.9258 in

9. Complete the following (circle all that apply):

a. Sine and Cosine are... cofunctions reciprocal functions inverse functions

b. Secant and cosine are reciprocal functions

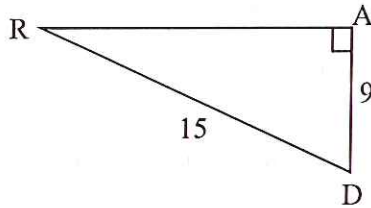
c. The tan of angle A is equal to the cot of angle B

d. The inverse of cosine is called arccosine



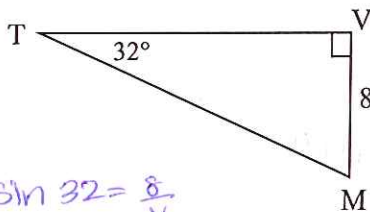
**PART 2: CALCULATOR** – Follow all directions and show all work neatly, including what you type into your calculator, to ensure full credit.

10. Solve  $\triangle RAD$ . Round to 4 decimals



$$\begin{aligned} \angle R &= \underline{36.8699^\circ} & r &= \underline{9} \\ \angle A &= \underline{90^\circ} & a &= \underline{15} \\ \angle D &= \underline{53.1301^\circ} & d &= \underline{12} \end{aligned}$$

11. Solve  $\triangle TVM$ . Round to 4 decimals.



$$\begin{aligned} \sin 32 &= \frac{8}{v} \\ \tan 32 &= \frac{8}{m} \end{aligned}$$

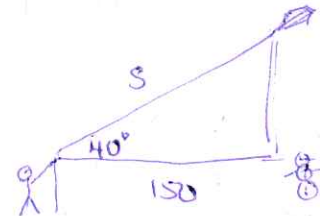
$$\begin{aligned} \angle T &= \underline{32^\circ} & t &= \underline{8} \\ \angle V &= \underline{90^\circ} & v &= \underline{15.0966} \\ \angle M &= \underline{58^\circ} & m &= \underline{12.8027} \end{aligned}$$

12. Elsa and Anna were flying a kite, and Olaf was running directly under the kite. Anna, who is 5'4" was holding the string, and sang, "Do you want to play a kite game? Try to guess how many feet of string I've already let out." Elsa said, "Okay, but don't give me hints by showing me the spool and don't change the length half way through. Conceal, don't reel." She sees Olaf is 150 feet away and sees string has an angle of elevation of  $40^\circ$ .

a. How many feet of string have been let out on the kite string?

$$\cos 40 = \frac{150}{s}$$

$$\boxed{195.8111 \text{ ft}}$$



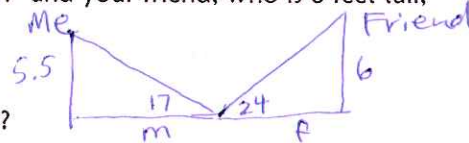
b. If Olaf wanted to throw his nose to hit the kite, how far would he have to throw it?

$$\begin{aligned} \tan 40 &= \frac{t}{150} = 125.8649 \\ &+ 5.3333 \end{aligned}$$

$$\boxed{131.1982 \leftarrow}$$

Hey, Mrs. S was born this year!!

13. Yikes! You have to take a trig test and both you and your friend forgot your calculators!! As you walk towards class from opposite sides of a hallway, you both spot a calculator on the floor between you. You, who are 5.5 feet tall, look the calculator at an angle of depression of  $17^\circ$  and your friend, who is 6 feet tall, looks at an angle of depression of  $24^\circ$ .



- a) How far apart are you and your friend when you spot the calculator?

$$\tan 17 = \frac{5.5}{m} \quad \tan 24 = \frac{6}{f}$$

$$\boxed{31.4659 \text{ ft}}$$

$$m = 17.9897 \quad f = 13.4762$$

- b) Rather than running, you decide whoever is closer will get it. Who is closer to the calculator? By how much?

$$\boxed{\text{My friend is by } 4.5135 \text{ ft}}$$

- c) Whew. You wake up and realize it was just a nightmare because you are charging your calculator right now.

$\boxed{\text{Whew!!}}$

14. Find the measure of the angle. Measure to the nearest tenth of a degree.

a.  $\cos \theta = .2456$

$$\boxed{\theta = 75.7827^\circ}$$

b.  $\sin \theta = 0.9077$

$$\boxed{\theta = 65.1894^\circ}$$

15. In the figure,  $m \angle A = 40^\circ$ ,  $\angle BDC = 61^\circ$ ,  $AB = 34$  and  $DB = 17$ . Find  $x$  and  $y$ .

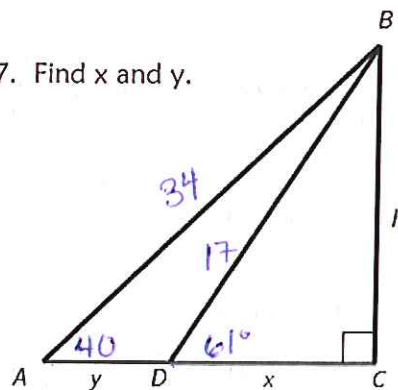
$$\cos 61 = \frac{x}{17}$$

$$\boxed{x = 8.2418}$$

$$\cos 40 = \frac{x+y}{34}$$

$$x+y = 26.0455$$

$$\boxed{y = 17.8037}$$



Note: This review was made and provided to you with the assumption that you have already completed ALL other classwork and homework assignments, as instructed. While this review is a good representation of the material to be covered, any particular question may be modeled after a problem from one of the textbook or packet questions assigned any time during the unit. If you struggled on any one of those problems, I would ensure you can do it, because you may see it again.