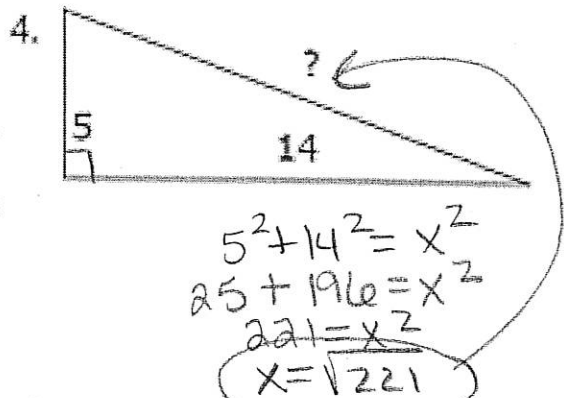
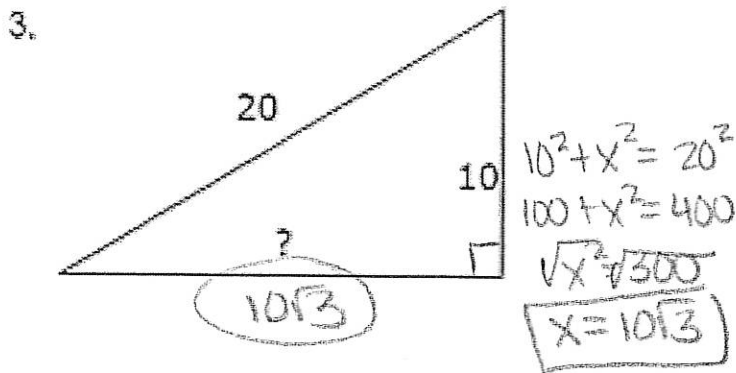
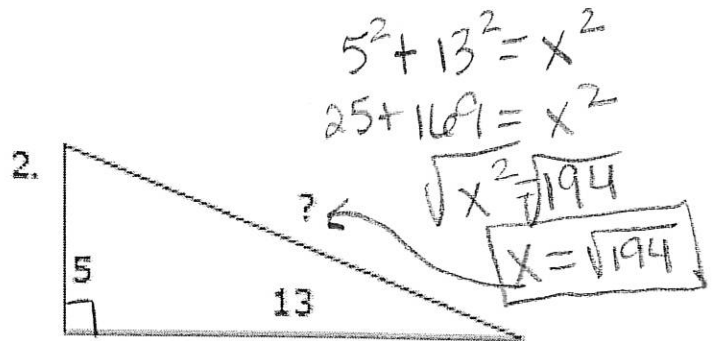
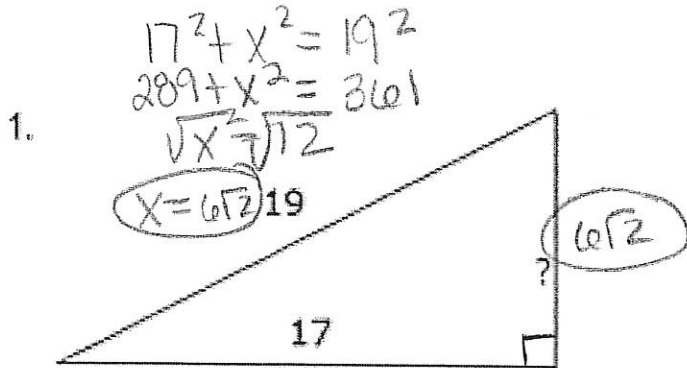


Problem Set 3.1

Key

1- 4] Find the missing side lengths of the given right triangles. Then find the area and perimeter of each triangle.



5 - 6] For the following let a and b be the legs of a right triangle and c be the hypotenuse of a right triangle. Find the missing side.

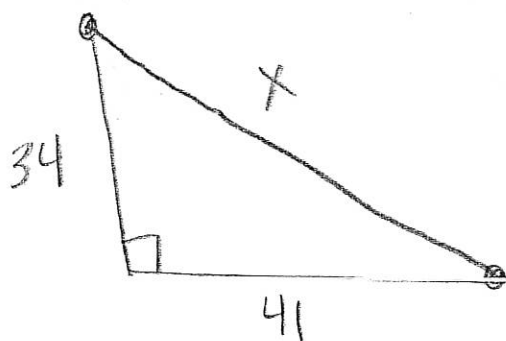
5. a = 12 b = 5 c = 13

$12^2 + 5^2 = c^2$
 $144 + 25 = c^2$
 $\sqrt{169} = \sqrt{c^2}$
 $c = 13$

6. a = 8 b = 6 c = 10

$8^2 + b^2 = 10^2$
 $64 + b^2 = 100$
 $\sqrt{b^2} = \sqrt{36}$
 $b = 6$

7. To get from point A to point B you must avoid walking through a pond. To avoid the pond, you must walk 34 meters south and 41 meters east. To the nearest meter, how many meters would be saved if it were possible to walk through the pond?

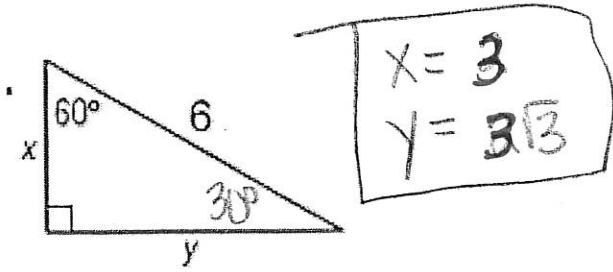


$34^2 + 41^2 = x^2$
 $\sqrt{2837} = \sqrt{x^2}$

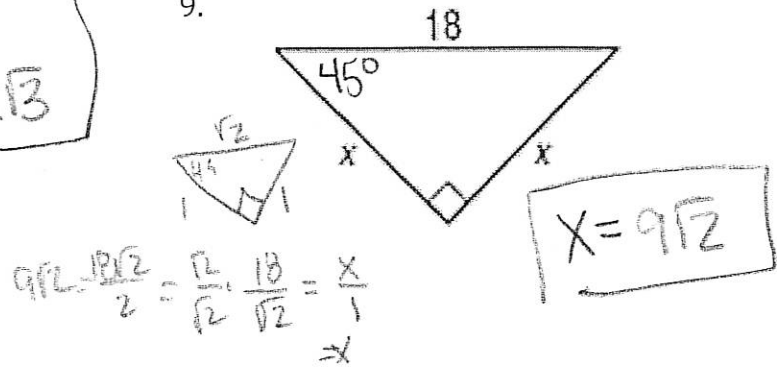
$x = 53.2635$
 $\boxed{53 \text{ m}}$

8 - 13] Find the length of each missing side denoted by a variable.

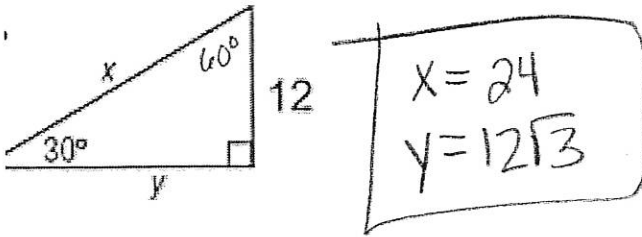
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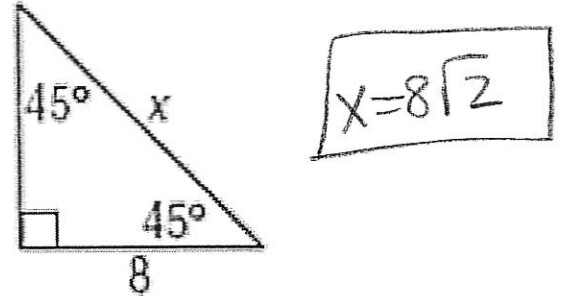
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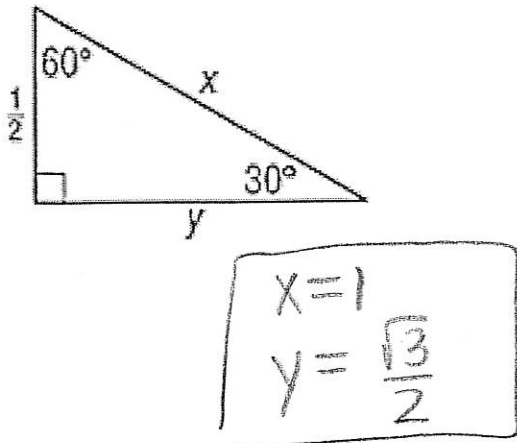
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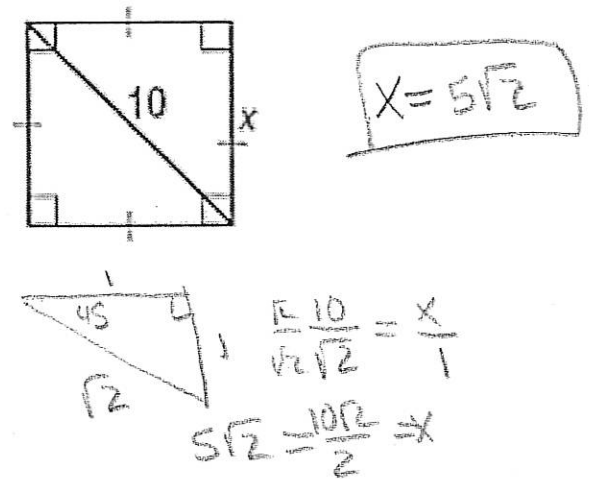
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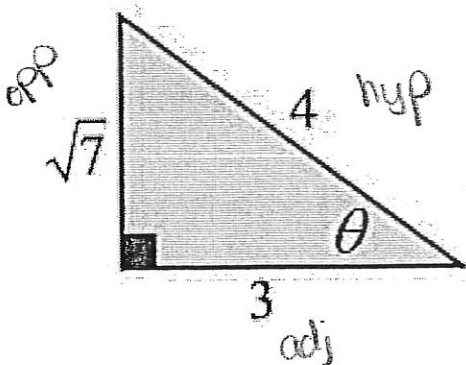
12.



13.



14] Evaluate the six trigonometric functions for the angle below.



$$\sin(\theta) = \frac{\sqrt{7}}{4}$$

$$\csc(\theta) = \frac{4\sqrt{7}}{7}$$

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

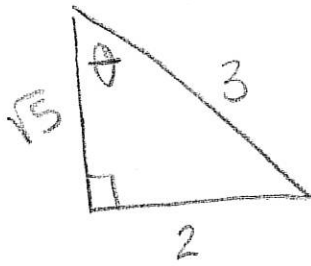
$$\sec(\theta) = \frac{4}{3}$$

$$\tan(\theta) = \frac{\sqrt{7}}{3}$$

$$\cot(\theta) = \frac{3\sqrt{7}}{7}$$

15] If $\sin(\theta) = \frac{2}{3}$, evaluate $\cos(\theta)$ and $\cot(\theta)$.

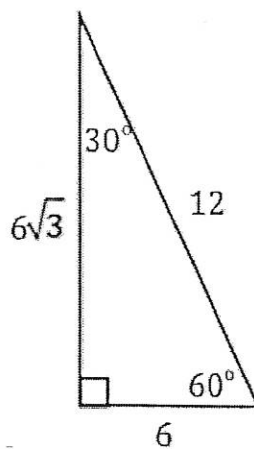
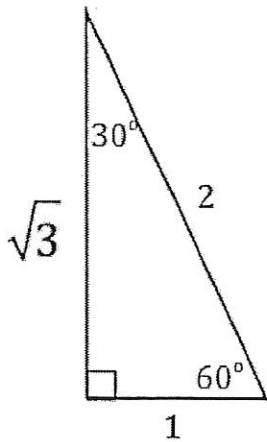
$$\begin{aligned} \angle + x &= 90^\circ \\ 4 + x^2 &= 9 \\ x &= \sqrt{5} \end{aligned}$$



$$\cos \theta = \frac{\sqrt{5}}{3}$$

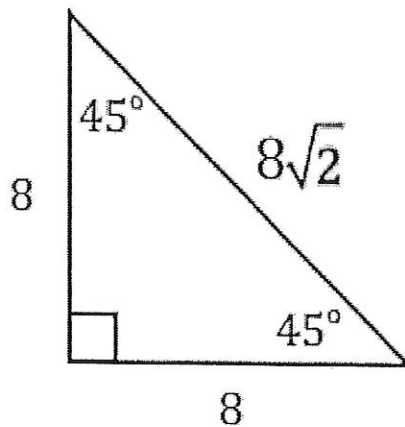
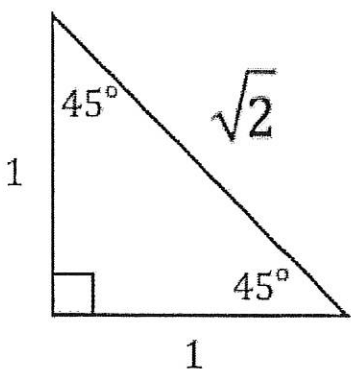
$$\cot \theta = \frac{\sqrt{5}}{2}$$

16] Consider the special right triangles below. Evaluate the six trigonometric functions for the 30° angle and the 60° angle. Do you recognize anything?



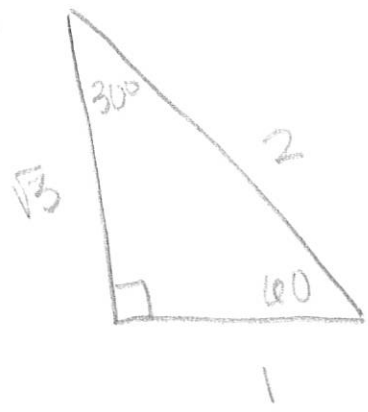
on sep paper

17] Consider the special right triangles below. Evaluate the six trigonometric functions for the 45° angle. Do you recognize anything?



on sep paper

10



$$\sin(30^\circ) = \frac{1}{2}$$

$$\csc(30^\circ) = 2$$

$$\cos(30^\circ) = \frac{\sqrt{3}}{2}$$

$$\sec(30^\circ) = \frac{2\sqrt{3}}{3}$$

$$\tan(30^\circ) = \frac{\sqrt{3}}{3}$$

$$\cot(30^\circ) = \sqrt{3}$$

$$\sin(60^\circ) = \frac{\sqrt{3}}{2}$$

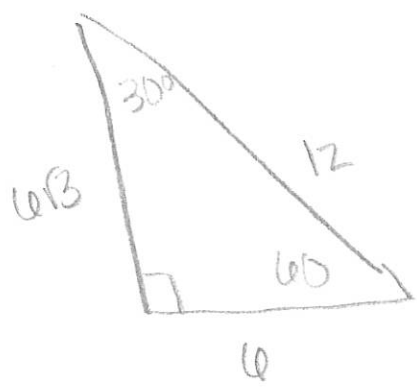
$$\csc(60^\circ) = \frac{2\sqrt{3}}{3}$$

$$\cos(60^\circ) = \frac{1}{2}$$

$$\sec(60^\circ) = 2$$

$$\tan(60^\circ) = \sqrt{3}$$

$$\cot(60^\circ) = \frac{\sqrt{3}}{3}$$



$$\sin(30^\circ) = \frac{6}{12} = \frac{1}{2}$$

$$\csc(30^\circ) = 2$$

$$\cos(30^\circ) = \frac{6\sqrt{3}}{12} = \frac{\sqrt{3}}{2}$$

$$\sec(30^\circ) = \frac{2\sqrt{3}}{3}$$

$$\tan(30^\circ) = \frac{6}{6\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$\cot(30^\circ) = \sqrt{3}$$

$$\sin(60^\circ) = \frac{\sqrt{3}}{2}$$

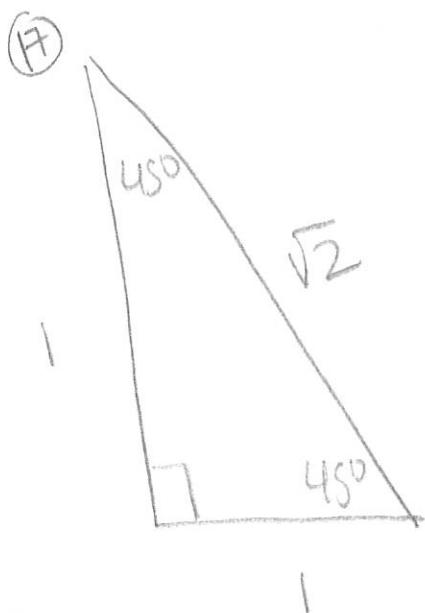
$$\csc(60^\circ) = \frac{2\sqrt{3}}{3}$$

$$\cos(60^\circ) = \frac{1}{2}$$

$$\sec(60^\circ) = 2$$

$$\tan(60^\circ) = \sqrt{3}$$

$$\cot(60^\circ) = \frac{\sqrt{3}}{3}$$



$$\sin(45^\circ) = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

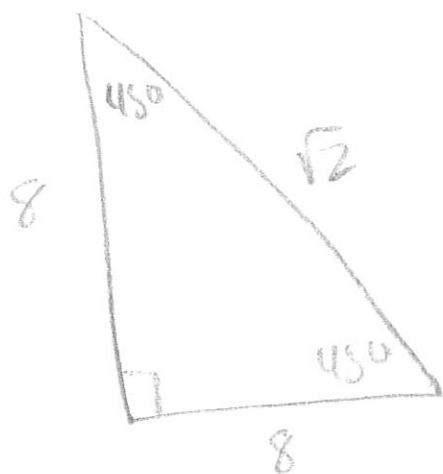
$$\csc(45^\circ) = \sqrt{2}$$

$$\cos(45^\circ) = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\sec(45^\circ) = \sqrt{2}$$

$$\tan(45^\circ) = 1$$

$$\cot(45^\circ) = 1$$



$$\sin(45^\circ) = \frac{\sqrt{2}}{2}$$

$$\csc(45^\circ) = \sqrt{2}$$

$$\cos(45^\circ) = \frac{\sqrt{2}}{2}$$

$$\sec(45^\circ) = \sqrt{2}$$

$$\tan(45^\circ) = 1$$

$$\cot(45^\circ) = 1$$