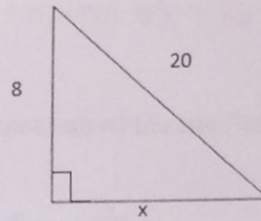


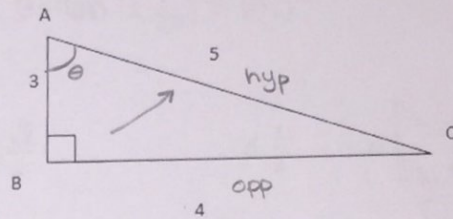
Multiple Choice. Choose the best answer. There is only one correct answer for each problem.

1. Find the value of  $x$ . Round to the nearest tenth.  
 a. 21.5                       b. 18.3  
 c. 0.21                         d. 5.3

Pyth. Thm:  
 $x = \sqrt{20^2 - 8^2}$   
 $x = 18.3$

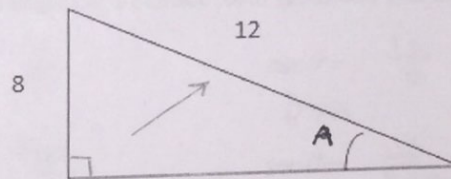


2. Using  $\triangle ABC$ , the sine of  $\angle A$  is  
 a.  $4/3$                              b.  $3/5$   
 c.  $4/5$                              d.  $3/4$



3. In the ratio  $\tan \theta = \frac{a}{b}$ . The  $a$  represents what part of the triangle?  $\theta$  is at vertex A.  
 a. leg                             b. hypotenuse                       c. opposite                             d. adjacent

4. What is  $A$  to the nearest degree?  
 a. 48                               b. 34  
 c. 42                               d. 30

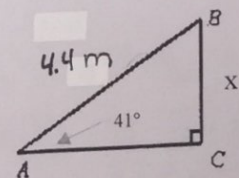


$\sin A = \frac{8}{12} \rightarrow A = \sin^{-1}\left(\frac{8}{12}\right) = 41.8^\circ$

5. Which is closest to the degree measure of an angle that measures 5 radians?  
 a.  $286^\circ$                          b.  $258^\circ$                              c.  $229^\circ$                              d.  $14^\circ$

$\frac{5}{\pi} \times 180^\circ = 286.47^\circ$

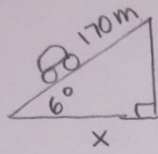
6. A slide 4.4 meters long makes an angle of  $41^\circ$  with the ground. How high is the top of the slide above the ground?  
 a. 2.4 m                             b. 2.5 m  
 c. 2.9 m                             d. 3.7 m



$\sin A = \frac{x}{4.4}$   
 $x = 4.4 (\sin 41^\circ) = 2.89$

7. Violet drives 170 meters up a hill that makes an angle of elevation of  $6^\circ$ . To the nearest tenth of a meter, what horizontal distance has she covered?  
 a. 171.5 m      b. 169.1 m      c. 1626.4 m      d. 17.8 m

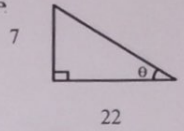
B



$$\cos 6^\circ = \frac{x}{170} \rightarrow x = 170 (\cos 6) = 169.1$$

8. Two legs of a right triangle have lengths 7 and 22. The measure of the smaller acute angle is  
 a.  $18.6^\circ$       b.  $71.4^\circ$   
 c.  $17.7^\circ$       d.  $72.3^\circ$

C

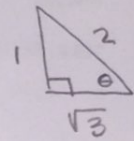


$$\tan \theta = \frac{7}{22}$$

$$\theta = \tan^{-1}\left(\frac{7}{22}\right) = 17.7^\circ$$

9. Find the exact value of  $\cos \theta$ , if  $\sin \theta = \frac{1}{2}$ .  
 a.  $\sqrt{3}$       b. 2      c.  $\frac{\sqrt{3}}{2}$       d.  $\frac{1}{2}$

C



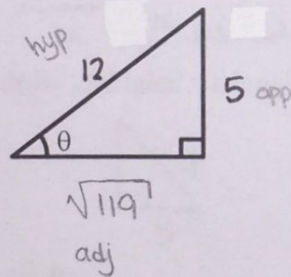
10. If  $\sin A = 0.906$ , then  $m\angle A =$  \_\_\_\_\_?  
 a.  $15^\circ$       b.  $0.02^\circ$       c.  $74.5^\circ$       d.  $65^\circ$

D

**Free Response. Show work.**

11. Find the values of the six trigonometric functions for angle  $\theta$  in exact form (reduced fractions; no decimals).

Pyth. Thm:  
 $x = \sqrt{12^2 - 5^2}$   
 $x = \sqrt{119}$



$$\sin \theta = \frac{5}{12} \quad \csc \theta = \frac{12}{5}$$

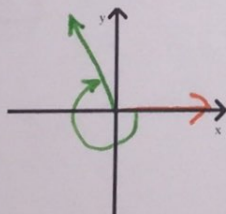
$$\cos \theta = \frac{\sqrt{119}}{12} \quad \sec \theta = \frac{12}{\sqrt{119}}$$

$$\tan \theta = \frac{5}{\sqrt{119}} \quad \cot \theta = \frac{\sqrt{119}}{5}$$

S O C H A T O  
 S H C H T A

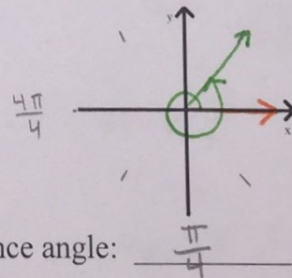
12. Sketch the angles in standard position. Then, find the reference angle and two coterminal angles, one positive and one negative. Your answers should be expressed in the same format as the original angle.

- a.  $-265^\circ$       b.  $\frac{9\pi}{4}$



pos:  $-265^\circ + 360^\circ = 95^\circ$   
 neg:  $-265^\circ - 360^\circ = -625^\circ$

reference angle:  $85^\circ$   
 coterminal angles:  $95^\circ$  &  $-625^\circ$



pos:  $\frac{\pi}{4}$   
 neg:  $\frac{9\pi}{4} - \frac{8\pi}{4} - \frac{8\pi}{4}$   
 $\frac{\pi}{4} - \frac{8\pi}{4}$   
 $= -\frac{7\pi}{4}$

reference angle:  $\frac{\pi}{4}$   
 coterminal angles:  $\frac{\pi}{4}$  &  $-\frac{7\pi}{4}$



13. Given the point  $(-4, \sqrt{5})$  on the terminal side of  $\theta$ , find  $\sin \theta$ ,  $\cos \theta$ , and  $\tan \theta$ . Leave answer in simplified fraction form.

$$\sin \theta = \frac{y}{r} = \frac{\sqrt{5}}{\sqrt{21}}$$

$$\cos \theta = \frac{x}{r} = \frac{-4}{\sqrt{21}}$$

$$\tan \theta = \frac{y}{x} = \frac{\sqrt{5}}{-4}$$

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$$x = -4$$

$$y = \sqrt{5}$$

$$r = \sqrt{(-4)^2 + (\sqrt{5})^2}$$

$$r = \sqrt{21}$$

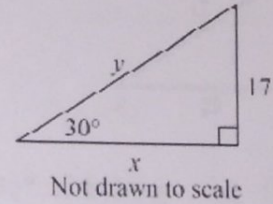
Q2

S	A
r	c

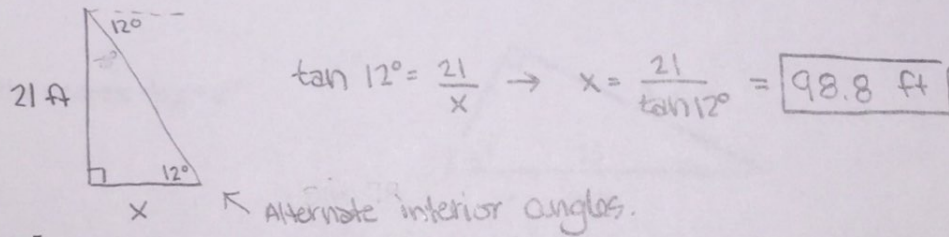
14. Find the value of  $x$  and  $y$ . Show equations. Round to the nearest tenth.

$$x: \cos 30^\circ = \frac{x}{y} \Rightarrow x = y \cos 30^\circ = \boxed{29.4}$$

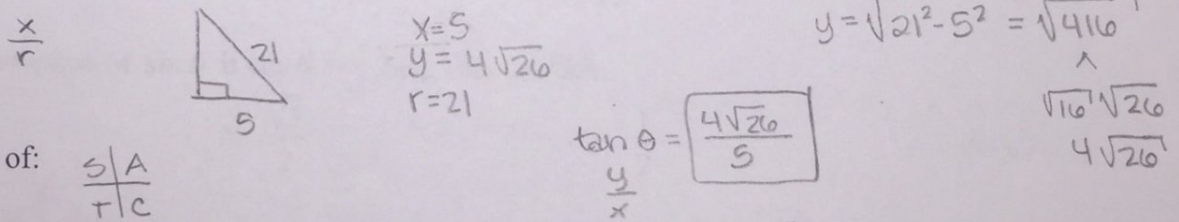
$$y: \sin 30^\circ = \frac{17}{y} \Rightarrow y = \frac{17}{\sin 30^\circ} = \boxed{34}$$



15. A forest ranger spots a fire from a 21-foot tall tower. The angle of depression from the tower to the fire is  $12^\circ$ . How far is the fire from the base of the tower? Round to the nearest tenth.

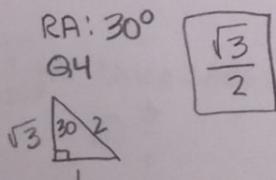


16. Given  $\cos \theta = \frac{5}{21}$ , draw and label a triangle and find  $\tan \theta$  in exact form.

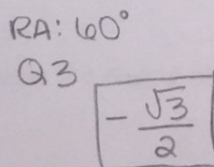


Find the exact value of:

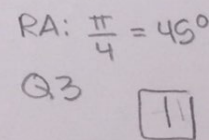
17.  $\cos 330^\circ$



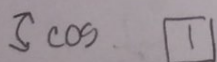
17.  $\sin 240^\circ$



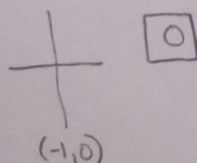
18.  $\tan \frac{5\pi}{4}$



19.  $\sec 0^\circ$



20.  $\sin \frac{3\pi}{2}$



21.  $\csc \frac{\pi}{3}$

