

1. Given $\theta = 400^\circ$
 A. In what quadrant does the terminal side fall?
I

B. Convert θ to radian measure.
 $\theta = \frac{20\pi}{9}$

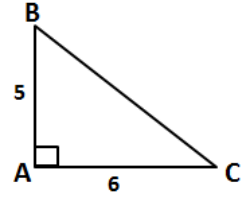
C. Find the reference angle.
 $\theta' = 40^\circ$

2. Given $\triangle ABC$, find the following:

a. $\cos C = \frac{6\sqrt{61}}{61}$

b. $\csc C = \frac{\sqrt{61}}{5}$

c. $\cot C = \frac{6}{5}$



3. Evaluate the following and give exact answers with rationalized denominators as needed. No Calculators.

a. $\sin 45^\circ = \frac{\sqrt{2}}{2}$

b. $\cos 60^\circ = \frac{1}{2}$

c. $\tan 30^\circ = \frac{\sqrt{3}}{3}$

d. $\sin 270^\circ = -1$

e. $\cos 0^\circ = 1$

f. $\csc 45^\circ = \sqrt{2}$

g. $\tan 45^\circ = 1$

h. $\sec 30^\circ = \frac{2\sqrt{3}}{3}$

i. $\tan \pi = 0$

j. $\sin\left(\frac{\pi}{3}\right) = \frac{\sqrt{3}}{2}$

k. $\tan\left(\frac{\pi}{4}\right) = 1$

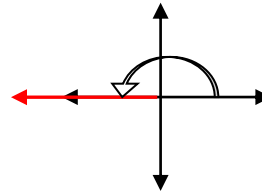
l. $\cos\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$

4. Find the values of θ in degrees $0^\circ \leq \theta \leq 360^\circ$ and radians $0 \leq \theta \leq 2\pi$ without the aid of a calculator. Find exact values for each. You will have four answers for each.

a. $\tan \theta = -\sqrt{3}$ $120^\circ = \frac{2\pi}{3}$ $300^\circ = \frac{5\pi}{3}$

b. $\csc \theta = \sqrt{2}$ $45^\circ = \frac{\pi}{4}$ $135^\circ = \frac{3\pi}{4}$

5. Sketch the angle in standard position. $\theta = 3.14$



6. Determine the quadrant in which each angle lies and sketch each angle in standard position.

a. $\frac{3\pi}{4}$ **II**

b. $\frac{24\pi}{7}$ **III**

c. 4.25 **III**

d. 840° **II**

e. -720° **positive x-axis**

7. Determine two coterminal angles (one positive and one negative) for each angle. Your units should match the given angle.

a. $\frac{5\pi}{4}$ **positive: $\frac{13\pi}{4}$ negative: $-\frac{3\pi}{4}$**

b. -540° **positive: 180° negative: -180°**

8. Sketch a right triangle corresponding to the trigonometric function of the acute angle θ . Use the Pythagorean theorem to determine the third side and then find the other five trigonometric functions of θ .

Sec $\theta = 6$ Constraint: Quadrant 1

$\sin \theta = \frac{\sqrt{35}}{6}$ $\cos \theta = \frac{1}{6}$
 $\tan \theta = \sqrt{35}$ $\csc \theta = \frac{6\sqrt{35}}{35}$ $\cot \theta = \frac{\sqrt{35}}{35}$

9. Evaluate (Exact answers, no decimals, rationalize denominator as needed)

a. $\sin 675^\circ = \frac{\sqrt{2}}{2}$ b. $\cos -930^\circ = -\frac{\sqrt{3}}{2}$

c. $\tan 420^\circ = \sqrt{3}$ d. $\sin\left(-\frac{11\pi}{3}\right) = \frac{\sqrt{3}}{2}$

e. $\cos\left(\frac{15\pi}{4}\right) = \frac{\sqrt{2}}{2}$ f. $\tan\left(-\frac{23\pi}{6}\right) = -\frac{\sqrt{3}}{3}$

10. Find the values of θ in degrees $0^\circ < \theta < 90^\circ$ and radians $0 < \theta < \frac{\pi}{2}$ by using a calculator.

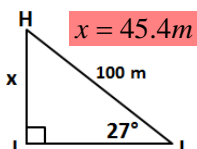
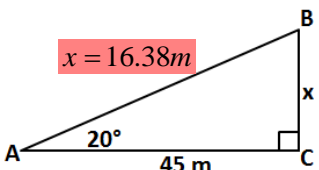
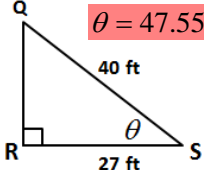
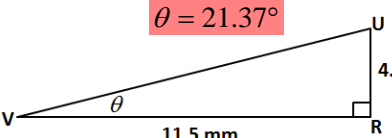
a. $\sin \theta = .2588$ $\theta = 15^\circ$ or $\frac{\pi}{12}$

b. $\tan \theta = .7002$ $\theta = 35^\circ$ or $\frac{7\pi}{36}$

c. $\cos \theta = .0872$ $\theta = 85^\circ$ or $\frac{17\pi}{36}$

11. Find the missing side.

12. Find the missing angle.

<p>a.  $x = 45.4m$</p> <p>b.  $x = 16.38m$</p>	<p>a.  $\theta = 47.55^\circ$</p> <p>b.  $\theta = 21.37^\circ$</p>
<p>13. The angle of elevation of the top of a building from a point 100 feet away level ground is 60°. Determine the height of the building. $height = 173.21ft$</p>	<p>14. The angle of depression of a buoy from a point on a lighthouse 98 feet above the water surface is 9°. Find the distance from the lighthouse to the buoy. $618.75ft$</p>
<p>15. Evaluate (if possible) the sine, cosine, and tangent of the real number.</p> <p>a. $\frac{4\pi}{3}$ $\sin \theta = -\frac{\sqrt{2}}{2}$ $\cos \theta = -\frac{1}{2}$ $\tan \theta = \sqrt{3}$</p> <p>b. $-\frac{5\pi}{3}$ $\sin \theta = \frac{\sqrt{3}}{2}$ $\cos \theta = \frac{1}{2}$ $\tan \theta = \sqrt{3}$</p> <p>c. $\sin(-4\pi)$ 0</p> <p>d. $\cos(-\frac{7\pi}{2})$ 0</p> <p>e. $\cot(\frac{30\pi}{6})$ 0</p>	
<p>16. Use a calculator to evaluate the expression. Round to four decimal places.</p> <p>a. $\sin\left(\frac{\sqrt{2}}{2}\right)$ 0.6496</p> <p>b. $\csc 5$ -1.0428</p> <p>c. $\sin 56^\circ$ 0.8290</p>	<p>17. Let $(9, 12)$ be a point on the terminal side of θ. Determine the exact values of \cos, \csc, and \cot.</p> <p>$\csc \theta = \frac{15}{12}$ $\cos \theta = \frac{9}{15}$ $\cot \theta = \frac{9}{12}$</p>
<p>18. Let $(4, 6)$ be a point on the terminal side of θ. Determine the exact values of \sin, \tan, \sec.</p> <p>$\sin \theta = \frac{6\sqrt{52}}{52}$ $\tan \theta = \frac{3}{2}$ $\sec \theta = \frac{\sqrt{52}}{4}$</p>	<p>19. State the quadrant in which θ lies.</p> <p>a. $\sin \theta > 0$ and $\cot \theta < 0$ II</p> <p>b. $\sec \theta < 0$ and $\csc \theta > 0$ II</p> <p>c. $\tan \theta < 0$ and $\sin \theta < 0$ IV</p>
<p>20. Find the values of \sin, \sec, \cot of θ.</p> <p>Function value constraint</p> <p>$\tan \theta = -\frac{4}{3}$ $\sin \theta = -\frac{4}{5}$ $\cot \theta = -\frac{3}{4}$ $\sec \theta = \frac{5}{3}$ $\cos \theta > 0$</p>	<p>21. Find the values of \cos, \csc, \cot of θ.</p> <p>Function value constraint</p> <p>$\sec \theta = 5$ $\cos \theta = \frac{1}{5}$ $\csc \theta = -\frac{5\sqrt{6}}{12}$ $\cot \theta = -\frac{\sqrt{6}}{12}$ $\sin \theta < 0$</p>
<p>22. Evaluate the trigonometric function of the quadrant angle. (No decimal in answer, rationalized if necessary)</p> <p>a. $\cos(\pi)$ -1</p> <p>b. $\cot\left(\frac{\pi}{2}\right)$ 0</p> <p>c. $\sec(2\pi)$ 1</p> <p>d. $\csc\left(\frac{3\pi}{2}\right)$ -1</p>	<p>23. Evaluate the cosine and tangent of the angle. (No decimal in answer, rationalized if necessary)</p> <p>a. $\frac{14\pi}{4}$ $\cos \theta = 0$ $\tan \theta = \text{undefined}$</p> <p>b. $-\frac{29\pi}{3}$ $\cos \theta = \frac{1}{2}$ $\tan \theta = \sqrt{3}$</p>
<p>24. Find two solutions of the equations. Give your answers in degrees $0^\circ \leq \theta \leq 360^\circ$ and radians $0 \leq \theta \leq 2\pi$. You should have 4 answers per problem.</p> <p>a. $\sin \theta = -\frac{\sqrt{3}}{2}$ $240^\circ = \frac{4\pi}{3}$ $300^\circ = \frac{5\pi}{3}$</p> <p>b. $\sec \theta = \frac{2\sqrt{3}}{3}$ $30^\circ = \frac{\pi}{6}$ $330^\circ = \frac{11\pi}{6}$</p>	<p>25. Find the five remaining trigonometric values.</p> <p>Function Constraint</p> <p>$\cos \theta = -\frac{5}{6}$ $\sin \theta > 0$</p> <p>$\sin \theta = \frac{\sqrt{11}}{6}$ $\csc \theta = \frac{6\sqrt{11}}{11}$ $\cot \theta = -\frac{5\sqrt{11}}{11}$ $\tan \theta = -\frac{\sqrt{11}}{5}$ $\sec \theta = -\frac{6}{5}$</p>
<p>26. There is a point $M(x, y)$ located on the terminal side of an angle, $\theta = 140^\circ$. The distance from the origin $(0, 0)$ to point M is 20. What are the coordinates of point M? Round to 2 decimal places. (What is x and y?)</p> <p>$M(-15.32, 12.86)$</p>	<p>27. Let $(\sqrt{39}, -5)$ be a point on the terminal side of θ. Determine the exact values of \sin, \tan, and \sec.</p> <p>$\sin \theta = -\frac{5}{8}$ $\sec \theta = \frac{8\sqrt{39}}{39}$ $\tan \theta = -\frac{5\sqrt{39}}{39}$</p>