PRE-CALCULUS
UNIT 1 REVIEW

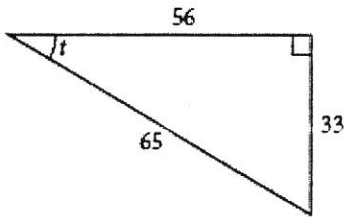
NAME _____

1. Using the triangle at right, find all the trig functions for angle t.

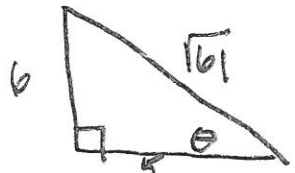
sin t = $\frac{33}{65}$ csc t = $\frac{65}{33}$

cos t = $\frac{56}{65}$ sec t = $\frac{65}{56}$

tan t = $\frac{33}{56}$ csc t = $\frac{56}{33}$



2. Let θ be an acute angle of a right triangle. Evaluate the other five trigonometric functions of θ if $\tan\theta = \frac{6}{5}$.



$\sin\theta = \frac{6}{\sqrt{61}}$ $\csc\theta = \frac{\sqrt{61}}{6}$

$\cos\theta = \frac{5}{\sqrt{61}}$ $\sec\theta = \frac{\sqrt{61}}{5}$

$\cot\theta = \frac{5}{6}$

3. Find all sides of a 30 – 60 – 90 triangle, given:

a. The side opposite the 30° is 12 $12\sqrt{3}$ 24

b. The hypotenuse is 22. 11 $11\sqrt{3}$

c. The side opposite 60° is 9. $\frac{9}{\sqrt{3}} = 3\sqrt{3}$ $6\sqrt{3}$

4. Find all sides of a 45 – 45 – 90 triangle, given:

a. The side opposite one of the 45° is 4. 4 $\sqrt{2}$

b. The side opposite one of the 45° is $2\sqrt{2}$. $2\sqrt{2}$ 4

c. The hypotenuse is 16. $\frac{16}{\sqrt{2}} = 8\sqrt{2}$ $8\sqrt{2}$

5. The distance between (3, 5) and (x, 3) is $\sqrt{5}$. Find ALL possible values of y.

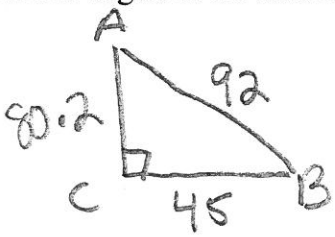
$\sqrt{(x-3)^2 + (-2)^2} = \sqrt{5}$

$x^2 - 6x + 9 + 4 = 5$ → $x^2 - 6x + 8 = 0$

$(x-4)(x-2) = 0$

$x = 4$ or $x = 2$

6. Given right triangle ABC with right angle C, a = 45 inches, and C = 92 inches, find all the missing parts. Round angles to the nearest tenth and sides to the nearest tenth of an inch.

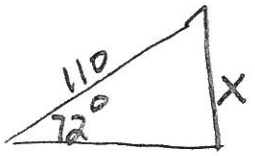


$\cos B = \frac{45}{92}$

$\angle B = 60.7°$

$\angle A = 29.3°$

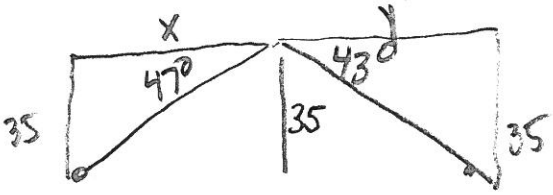
7. A safety regulation that the maximum angle of elevation for a rescue ladder is 72°. If a fire department's longest ladder is 110 feet, what is the maximum safe rescue height?



$\sin 72^\circ = \frac{x}{110}$

$x = 104.6\text{ft}$

8. Two guy wires from the top of a 35-foot tent pole are anchored to the ground below by two stakes so that the two stakes and the tent pole lie along the same line. If the angle of depression from the top of the pole to each of the stakes are 47° and 43°, how far apart are the stakes? (Assume the tent pole is perpendicular to the ground and between the two stakes.)



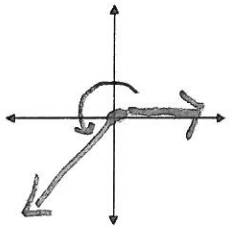
$\tan 47^\circ = \frac{35}{x}$ $\tan 43^\circ = \frac{35}{y}$

$x = 32.6$ $y = 37.5$

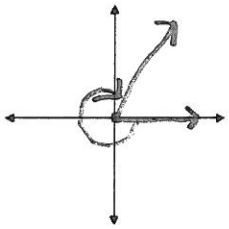
$x + y = 70.1$

9. Draw the following angles in standard position. Name one positive and one negative co-terminal angle. (If the angle is in radians, the co-terminal angles should be in radians)

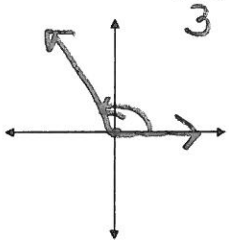
a. 200° 560° -160°



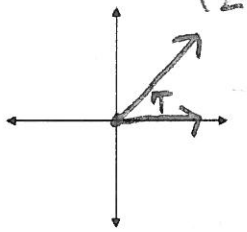
b. -345° 15° -705°



c. $\frac{2\pi}{3}$ $\frac{8\pi}{3}$ $-\frac{4\pi}{3}$



d. $\frac{5\pi}{12}$ $\frac{29\pi}{12}$ $-\frac{19\pi}{12}$



10. Convert the radian measure to degrees and the degree measure to radians.

a. $320^\circ = \frac{16\pi}{9}$

b. $\frac{7\pi}{9} = 140^\circ$

d. $-240^\circ = -\frac{4\pi}{3}$

d. $\frac{-11\pi}{6} = -330^\circ$

$320 \cdot \frac{\pi}{180} =$

11. A Ferris wheel with a diameter of 165 feet was built in St. Louis in 1986. It is called Colossus. Find the distance traveled by someone starting at initial position P_o and moving to position P_1 if $\theta = 240°$.

$240° \cdot \frac{\pi}{180} = \frac{4\pi}{3}$

$\frac{4\pi}{3} = \frac{s}{82.5}$

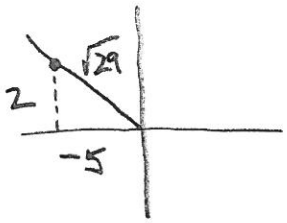
$s = 345.8$ ft.

12. Given the point $(-5, 2)$ lies on the terminal side of an angle in standard position, find all trig functions of the angle.

$\sin\theta = \frac{2}{\sqrt{29}}$ $\quad \csc\theta = \frac{\sqrt{29}}{2}$

$\cos\theta = \frac{-5}{\sqrt{29}}$ $\quad \sec\theta = \frac{\sqrt{29}}{-5}$

$\tan\theta = \frac{-2}{5}$ $\quad \cot\theta = \frac{-5}{2}$

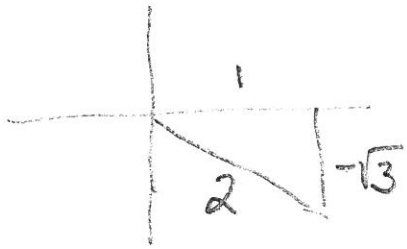


13. Give the point $\left(1, -\sqrt{3}\right)$ lies on the terminal side of an angle in standard position, find all trig functions of the angle.

$\sin\theta = \frac{-\sqrt{3}}{2}$ $\quad \csc\theta = \frac{-2}{\sqrt{3}}$

$\cos\theta = \frac{1}{2}$ $\quad \sec\theta = 2$

$\tan\theta = -\sqrt{3}$ $\quad \cot\theta = \frac{-1}{\sqrt{3}}$

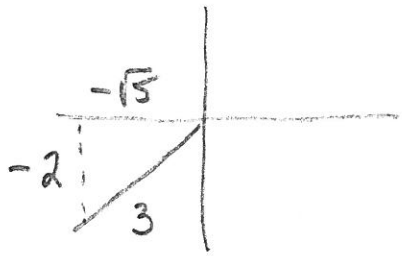


14. Given $\cos\theta = -\frac{\sqrt{5}}{3}$ and θ lies in Quadrant III, find the remaining trig functions.

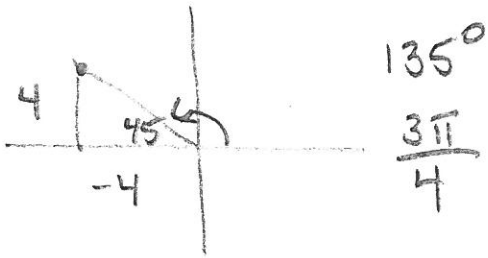
$\sin\theta = \frac{-2}{3}$ $\quad \csc\theta = \frac{-3}{2}$

$\cos\theta = \frac{-\sqrt{5}}{3}$ $\quad \sec\theta = \frac{-3}{\sqrt{5}}$

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



15. θ is an angle in standard position and $0° \le \theta \le 360°$ or $0 \le \theta \le 2\pi$. Find θ in both degrees and radians if its terminal side passes through the given point P(-4, 4).

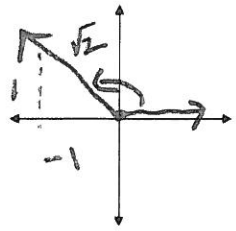


$135°$

$\frac{3\pi}{4}$

16. Draw each of the following angles in standard position. Then, evaluate the sine, cosine and tangent for each of the following angles.

a. $\theta = 135°$

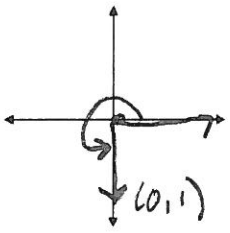


$\sin 135 = \frac{\sqrt{2}}{2}$

$\cos 135 = -\frac{\sqrt{2}}{2}$

$\tan 135° = -1$

b. $\theta = \frac{3\pi}{2}$

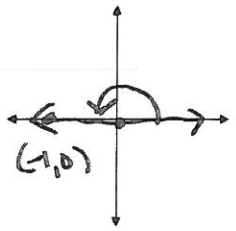


$\sin \frac{3\pi}{2} = -1$

$\cos \frac{3\pi}{2} = 0$

$\tan \frac{3\pi}{2} = UD$

c. $\theta = 180°$

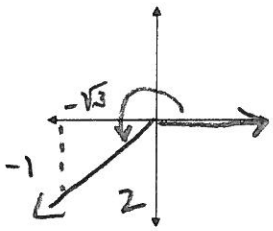


$\sin 180° = 0$

$\cos 180° = -1$

$\tan 180° = 0$

d. $\theta = \frac{7\pi}{6}$

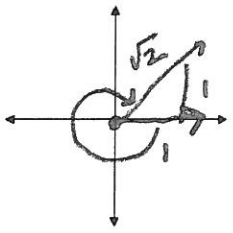


$\sin \frac{7\pi}{6} = -\frac{1}{2}$

$\cos \frac{7\pi}{6} = \frac{-\sqrt{3}}{2}$

$\tan \frac{7\pi}{6} = \frac{1}{\sqrt{3}}$

e. $\theta = -\frac{7\pi}{4}$

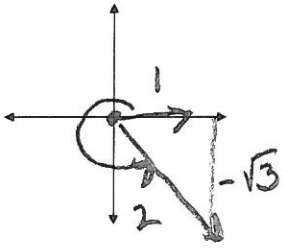


$\sin -\frac{7\pi}{4} = \frac{\sqrt{2}}{2}$

$\cos -\frac{7\pi}{4} = \frac{\sqrt{2}}{2}$

$\tan -\frac{7\pi}{4} = 1$

f. $\theta = 300°$



$\sin 300 = -\frac{\sqrt{3}}{2}$

$\cos 300 = \frac{1}{2}$

$\tan 300 = -\sqrt{3}$