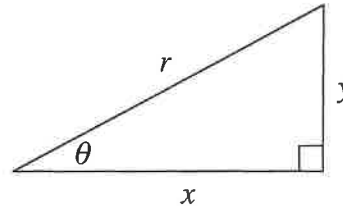


Honors Precalculus '21-22
 Trig Basics Test
 Part I--CALCULATOR ALLOWED

Name SOLUTION KEY

1. In the figure to the right, $\sin \theta \tan \theta =$

$$\frac{y}{r} \cdot \frac{y}{x}$$



- a) $\frac{x}{r}$ b) $\frac{y}{r}$ c) $\frac{y^2}{rx}$ d) $\frac{x^2}{ry}$ e) $\frac{xy}{r^2}$

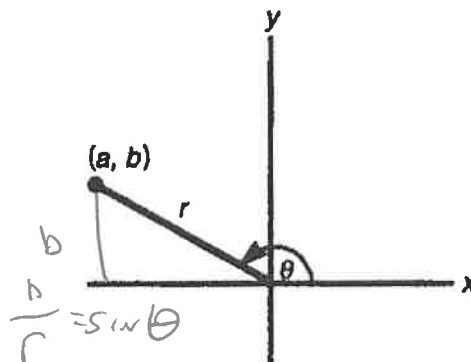
2. The magnitude of $\vec{v} = \sqrt{7}\vec{i} - \sqrt{6}\vec{j}$ is

$$\sqrt{7+6}$$

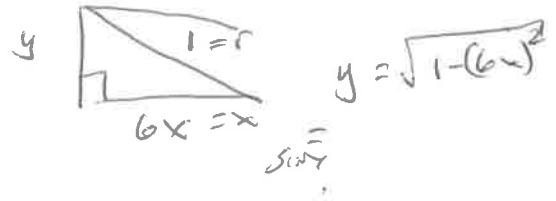
- a) 1 b) $\sqrt{13}$ c) $\sqrt{55}$ d) $\sqrt{85}$ e) 85

3. In the figure $r \sin \theta$ equals

- a) a
 b) b
 c) $-a$
 d) $-b$
 e) $a+b$

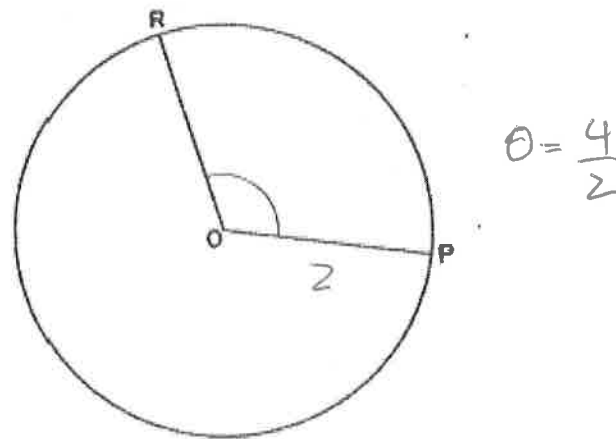


4. Simplify the expression $\sin(\cos^{-1} 6x)$.



- a) $\sqrt{1-6x^2}$ b) $\sqrt{1+6x^2}$ c) $\sqrt{36x^2-1}$
d) $\sqrt{1+36x^2}$ e) $\sqrt{1-36x^2}$

5. In the figure below, Circle O has radius 2 and \widehat{PR} has length 4. What is the radian measure of $\angle POR$?



- a) 1 b) 2 c) 4 d) $\frac{1}{\pi}$ e) π

6. If the terminal side of α passes through $(-9, 5)$, then $\tan \alpha =$

- a) $-\frac{9}{5}$ b) $-\frac{5}{9}$ c) $-\frac{9}{\sqrt{106}}$ d) $\frac{5}{9}$ e) $\frac{9}{5}$
-

7. What is the measure of an angle whose cosine is twice the cosine of 60° ?

- a) 30° b) 60° c) 90°
d) 120° e) None of these
-

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

$$\theta = 0^\circ + 2\pi n$$

Part II--CALCULATOR ALLOWED

$$r = \sqrt{16 + 49} = \sqrt{65}$$

1. $(-4, -7)$ is on the terminal side of A . Find the six exact trig values:

$\sin A = -7/\sqrt{65}$	$\csc A = -\sqrt{65}/7$
$\cos A = -4/\sqrt{65}$	$\sec A = -\sqrt{65}/4$
$\tan A = 7/4$	$\cot A = 4/7$

2. If $\tan B = -7/24$ in QII, find the other five exact trig values:

$\sin B = 7/25$	$y = 7$	$\csc B = 25/7$
$\cos B = -24/25$	$x = -24$	$\sec B = -25/24$
$\tan B = -7/24$	$r = 25$	$\cot B = -24/7$

3. What are the approximate values, in degrees of A and B (from #1 and #2)?

$A = \underline{-119.745 \pm 360n}$

$B = \underline{163.740 \pm 360n}$

4. (a) Find the approximate values of:

$$\cos -35 = -0.904$$

$$\sin -206^\circ = 0.438$$

$$\tan 1.46 = 8.989$$

$$\sec -546 = 1.170$$

$$\csc 7.26^\circ = 7.913$$

$$\cot 30 = -0.156$$

(b) Find the approximate values (in degrees) of:

$$\cos^{-1} .855 = \left\{ \pm 31.24^\circ \pm 360^\circ n \right.$$

$$\sin^{-1} (-.375) = \left\{ \begin{array}{l} -22.024^\circ \pm 360^\circ n \\ 202.024^\circ \pm 360^\circ n \end{array} \right.$$

$$\tan^{-1} 5.058 = 78.816^\circ \pm 180^\circ n$$

$$\sec^{-1} -.982 = \text{No Solution}$$

$$\csc^{-1} -1.362 = \left\{ \begin{array}{l} -47.241^\circ \pm 360^\circ n \\ 227.241^\circ \pm 360^\circ n \end{array} \right.$$

5. A boat sails 37 mph at a bearing of 113° . The current flows 5 mph at 274° . Find the magnitude and bearing of the resultant vector.

$$\vec{b} = 37 \cos 113^\circ \vec{i} + 37 \sin 113^\circ \vec{j}$$

$$\vec{c} = 5 \cos 274^\circ \vec{i} + 5 \sin 274^\circ \vec{j}$$

$$\vec{r} = \vec{b} + \vec{c} = -14.108 \vec{i} + 29.071 \vec{j}$$

$$|\vec{r}| = \sqrt{14.108^2 + 29.071^2} = 32.313 \text{ MPH}$$

$$\theta = \cos^{-1} \left(\frac{-14.108}{32.313} \right) = 115.888^\circ$$

6. Identify the quadrant and reference angle of:

a) 585°

Q III

$\theta_{ref} = 45^\circ$

b) -472°

Q III

$\theta_{ref} = 68^\circ$

c) 2672°

Q II

$\theta_{ref} = 28^\circ$

d) -642°

Q I

$\theta_{ref} = 78^\circ$

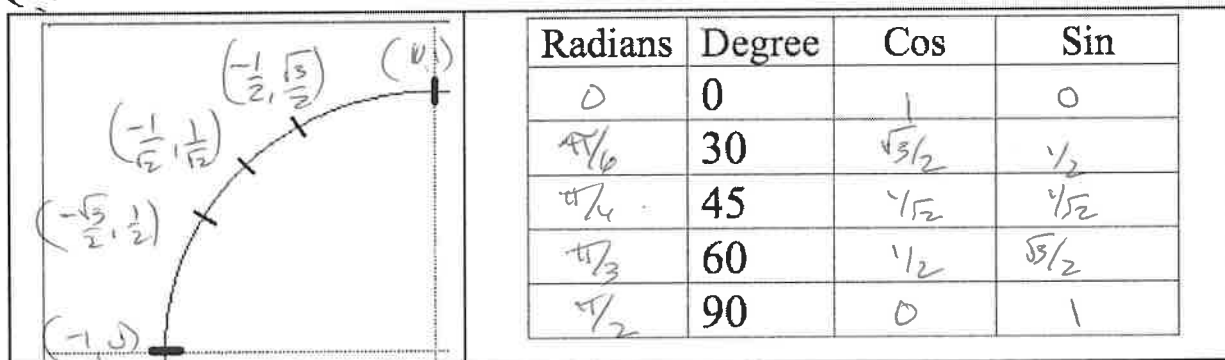
Trig Basics Test

Part III

NO CALCULATOR ALLOWED

Round to 3 decimal places. Show all work

1. Fill in the coordinates from QII of the Unit Circle and the Table Values from QII.



2. Find the exact value of the following:

(a) $\csc \frac{5\pi}{6} \tan \frac{3\pi}{4} \cos \frac{2\pi}{3} = \left(\frac{2}{1}\right) (-1) \left(-\frac{1}{2}\right) = 1$

(b) $\sin \frac{\pi}{6} \cos \frac{\pi}{3} + \sin \frac{\pi}{3} \cos \frac{\pi}{6} = \left(\frac{1}{2}\right) \left(\frac{1}{2}\right) + \left(\frac{\sqrt{3}}{2}\right) \left(\frac{\sqrt{3}}{2}\right) = \frac{1}{4} + \frac{3}{4} = 1$

(c) $\cos\left(\frac{5\pi}{4}\right) - \sin\left(\frac{\pi}{2}\right) + \tan\left(\frac{13\pi}{6}\right) = -\frac{1}{\sqrt{2}} - (1) + \frac{1}{\sqrt{3}} = \frac{-\sqrt{3} + \sqrt{2} + \sqrt{6}}{\sqrt{6}}$