June 19, 2019

9 Trigonometric functions

Student ID No.											Name
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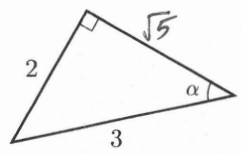
1 For the right triangle in the figure below, find the sine, cosine, and tangent of the angle α.



a) $\sin\alpha = \frac{2}{3}$

b) $\cos\alpha = \frac{\sqrt{5}}{3}$

c) $\tan\alpha = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$

2 Express the following expressions in terms of $\sin\theta$, $\cos\theta$, $\tan\theta$.

a) $\sin(90° - \theta) =$ $\cos\theta$

b) $\cos(90° - \theta) =$ $\sin\theta$

c) $\tan(90° - \theta) =$ $\frac{1}{\tan\theta}$

3 Assuming $\sin\theta = \frac{4}{5}$ and $0° < \theta < 90°$, find the following values.

a) $\cos\theta = \frac{3}{5}$

b) $\tan\theta = \frac{4}{3}$

4 Convert the following angles to radians.

a) $90° = \frac{\pi}{2}$

b) $120° = \frac{2\pi}{3}$

c) $210° = \frac{7\pi}{6}$

d) $225° = \frac{5}{4}\pi$

e) $240° = \frac{4\pi}{3}$

f) $330° = \frac{11\pi}{6}$

5 Convert each radian measure to degrees.

a) $\frac{\pi}{6} =$ $30°$

b) $\frac{\pi}{3} =$ $60°$

c) $\frac{3\pi}{4} =$ $135°$

d) $\frac{4\pi}{3} =$ $240°$

e) $\frac{3\pi}{2} =$ $270°$

f) $\frac{7\pi}{4} =$ $315°$

6 Complete the following table.

θ	$\frac{7}{6}\pi$	$\frac{7}{4}\pi$	$\frac{5}{4}\pi$	$-\frac{\pi}{3}$	$-\pi$
$\sin\theta$	$-\frac{1}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{3}}{2}$	0
$\cos\theta$	$-\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	-1

7 Express the following expressions in terms of $\sin\theta$, $\cos\theta$, $\tan\theta$.

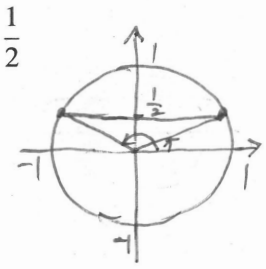
a) $\sin(-\theta) =$ $-\sin\theta$

b) $\cos(-\theta) =$ $\cos\theta$

c) $\tan(-\theta) =$ $-\tan\theta$

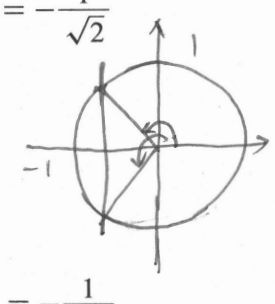
8 Solve each of the following equations for θ assuming $0 \leqq \theta < 2\pi$.

a) $\sin\theta = \frac{1}{2}$



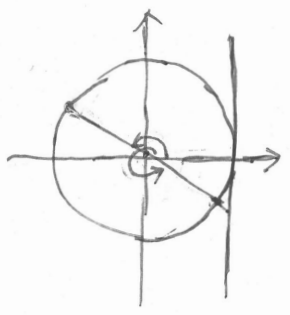
$\theta = \frac{\pi}{6}, \frac{5\pi}{6}$

b) $\cos\theta = -\frac{1}{\sqrt{2}}$



$\theta = \frac{3\pi}{4}, \frac{5\pi}{4}$

c) $\tan\theta = -\frac{1}{\sqrt{3}}$



$\theta = \frac{5\pi}{6}, \frac{11\pi}{6}$