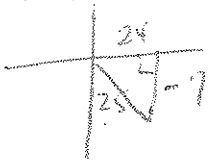
Review Ch. 5 p. 254 1-6, 8-9

Name Key

Show work for all problems. Write out formula used.

Date _____ Hour ____

1. If $\cos\theta = \frac{24}{25}$ and θ is in quadrant IV, find the five remaining trigonometric function values of θ.



1) $\sin\theta =$ $\frac{-7}{25}$ $\csc\theta =$ $\frac{25}{-7}$

$\cos\theta = \frac{24}{25}$ $\sec\theta =$ $\frac{25}{24}$

$\tan\theta =$ $\frac{-7}{24}$ $\cot\theta =$ $\frac{24}{-7}$

2. Express $\sec\theta - \sin\theta\tan\theta$ as a single function of θ.

$\frac{1}{\cos\theta} - \sin\theta\left(\frac{\sin\theta}{\cos\theta}\right)$

$\frac{1-\sin^2\theta}{\cos\theta} \cdot \frac{\cos^2\theta}{\cos\theta}$

2) $\cos\theta$

3. Express $\tan^2 x - \sec^2 x$ in terms of $\sin x$ and $\cos x$, and simplify.

$\frac{\sin^2 x}{\cos^2 x} - \frac{1}{\cos^2 x} = -\frac{\cos^2 x}{\cos^2 x}$

3) -1

4. Find the exact value of $\cos\frac{5\pi}{12}$. $\frac{15}{4}$ 75°

$\cos(45+30) = \cos 45\cos 30 - \sin 45\sin 30$

$\frac{\sqrt{2}}{2}\frac{\sqrt{3}}{2} - \frac{\sqrt{2}}{2}\frac{1}{2}$

4) $\frac{\sqrt{6}-\sqrt{2}}{4}$

5. Express as a function of x alone.

(a) $\cos(270° - x)$ **(b)** $\tan(\pi + x)$

$\frac{\tan\pi + \tan x}{1 - \tan\pi\tan x}$

$\cos 270\cos x + \sin 270\sin x$

$0 \quad -1$

5) a) $-\sin x$

b) $\tan x$

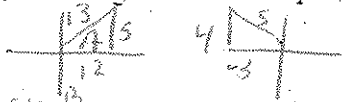
6. Use a half-angle identity to find the exact value of $\sin(-22.5°)$.

$\sin(-22.5) = -\sqrt{\frac{1-\cos 45}{2}}$

$\sqrt{\frac{1-\frac{\sqrt{2}}{2}}{2}}$ $\sqrt{\frac{2-\sqrt{2}}{4}}$

6) $-\frac{\sqrt{2-\sqrt{2}}}{2}$

8. Given that $\sin A = \frac{5}{13}$, $\cos B = -\frac{3}{5}$, A is a quadrant I angle, and B is a quadrant II angle, find each of the following.



(a) $\sin(A+B) = \sin A\cos B + \cos A\sin B$

$\frac{5}{13}\left(\frac{-3}{5}\right) + \frac{12}{13}\left(\frac{4}{5}\right)$ $\frac{-15}{65} + \frac{48}{65} = \frac{33}{65}$

(b) $\cos(A+B) = \cos A\cos B - \sin A\sin B$

$\frac{12}{13}\left(\frac{-3}{5}\right) - \frac{5}{13}\left(\frac{4}{5}\right)$ $\frac{-36}{65} - \frac{20}{65} = \frac{-56}{65}$

(c) $\tan(A-B)$ $\frac{\tan A - \tan B}{1+\tan A\tan B}$ $\frac{\frac{5}{12} - \frac{-4}{3}}{1 + \frac{-20}{36}}\left(\frac{36}{36}\right)$

(d) the quadrant of $A + B$

$\cos(A+B) = \cos A\cos B$

$\frac{15+48}{36-20} = \frac{63}{16}$

8) a) $\frac{33}{65}$

b) $\frac{-56}{65}$

c) $\frac{63}{16}$

d) II

9. Given that $\cos\theta = -\frac{3}{5}$ and $\frac{\pi}{2} \le \theta < \pi$, find each of the following.

9) a) $-\frac{7}{25}$

b) $-\frac{24}{25}$

c) $\frac{24}{7}$

d) $\frac{\sqrt{5}}{5}$

e) 2

(a) $\cos 2\theta = 2\left(-\frac{3}{5}\right)^2 - 1 = 2\left(\frac{9}{25}\right) - 1 = \frac{18}{25} - \frac{25}{25} = -\frac{7}{25}$

(b) $\sin 2\theta = 2\left(\frac{4}{5}\right)\left(-\frac{3}{5}\right) = -\frac{24}{25}$

(c) $\tan 2\theta = \frac{2\tan\theta}{1-\tan^2\theta} = \frac{2\left(-\frac{4}{3}\right)}{1-\frac{16}{9}} = \frac{-\frac{8}{3}}{-\frac{7}{9}} \quad -\frac{8}{3}\cdot\frac{3}{7}$

(d) $\cos\frac{1}{2}\theta = \pm\sqrt{\frac{1+\cos\theta}{2}} = \sqrt{\frac{1-\frac{3}{5}}{2}} \quad \sqrt{\frac{\frac{2}{5}}{2}} = \frac{1}{\sqrt{5}}$

(e) $\tan\frac{1}{2}\theta = \pm\sqrt{\frac{1-\cos x}{1+\cos x}} \quad \sqrt{\frac{1+\frac{3}{5}}{1-\frac{3}{5}}} \quad \frac{1+\frac{3}{5}}{1-\frac{3}{5}} = \sqrt{\frac{\frac{8}{5}}{\frac{2}{5}}} = \sqrt{4} = 2$

Answers:

[5.1] 1. $\sin\theta = -\frac{7}{25}$; $\tan\theta = -\frac{7}{24}$, $\cot\theta = -\frac{24}{7}$; $\sec\theta = \frac{25}{24}$, $\csc\theta = -\frac{25}{7}$

2. $\cos\theta$ 3. -1

[5.3] 4. $\frac{\sqrt{6}-\sqrt{2}}{4}$

[5.3, 5.4] 5. (a) $\sin x$ (b) $\tan x$

[5.6] 6. $-\frac{\sqrt{2-\sqrt{3}}}{2}$

[5.3, 5.4] 8. (a) $\frac{33}{65}$ (b) $-\frac{56}{65}$ (c) $\frac{63}{16}$ (d) II

[5.5, 5.6] 9. (a) $-\frac{7}{25}$ (b) $\frac{24}{25}$ (c) $\frac{24}{7}$ (d) $\frac{\sqrt{5}}{5}$ (e) 2