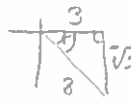

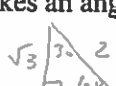
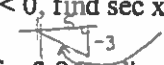


Practice for Semester 2 Exam

Name Solutions

- If $\cos x = \frac{3}{8}$, and x is in Quadrant IV, find $\tan x$.  $\tan x = \frac{-\sqrt{55}}{3}$
- Which of the following is complementary to $\theta = \frac{2\pi}{7}$? $\frac{2\pi}{7} + x = \frac{\pi}{2}$ $x = \frac{\pi}{2} - \frac{2\pi}{7} = \frac{7\pi}{14} - \frac{4\pi}{14} = \frac{3\pi}{14}$
- Express an angle of 18° in radian measure. $18^\circ \left(\frac{\pi}{180^\circ}\right) = \frac{\pi}{10}$
- Convert 4 radians to degrees (rounded). $4 \left(\frac{180^\circ}{\pi}\right) = 229^\circ$
- The needle of the scale in the produce section of a supermarket is 30 cm long. Find the approximate distance the tip of the needle travels when it rotates 96° . $\frac{96}{360} (2\pi \cdot 30) = 50 \text{ cm}$
- Find the exact value of $\cos \frac{7\pi}{6}$. $\frac{-\sqrt{3}}{2}$
- Use trigonometric identities to see which of the following is equal to $(\sec x + \tan x)(\sec x - \tan x) = \sec^2 x - \tan^2 x = 1$
- A 20 meter line is used to tether a helium-filled balloon. Because of a breeze, the line makes an angle of 60° with the ground. What is the height of the balloon?  $10\sqrt{3}$  $30^\circ-60^\circ-90^\circ \triangle$
- The sides of a square each measure 6 inches. Find the length of the diagonal (exact value.) $6\sqrt{2}$
- Given $\cot x = -5/3$ and $\sin x < 0$, find $\sec x$.  $\sec x = \frac{\text{Hyp}}{\text{Adj}} = \frac{\sqrt{34}}{5}$
- What is the reference angle for 3.96 radians (rounded)? $3.96 - \pi \approx 0.82$
- Find two solutions to the equation $\cos x = -\frac{\sqrt{3}}{2}$, if $0^\circ \leq x \leq 360^\circ$. $150^\circ, 210^\circ$

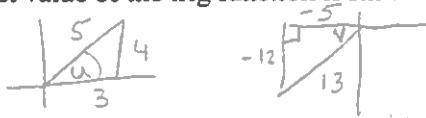
For questions 13 – 16, use $f(x) = -4 \cos(3x + 5) + 7$.

- What is the amplitude of the equation? 4
- What is the period? $\frac{2\pi}{b} = \frac{2\pi}{3}$
- What is the phase shift? $-\frac{c}{b} = \frac{-5}{3}$
- What is the equation of the midline? $y = 7$
- Find a positive and a negative coterminal angle in radians for $\frac{5\pi}{3}$. $\frac{5\pi}{3} + 2\pi = \frac{5\pi}{3} + \frac{6\pi}{3} = \frac{11\pi}{3}$
 $\frac{5\pi}{3} - \frac{6\pi}{3} = \frac{-\pi}{3}$
- Find the reference angle for -255° . 75°
- Given a right triangle with right angle C, side $a = 5$, side $b = 12$, how would you find the measure of angle A? $\tan A = \frac{5}{12}$ $\tan^{-1}\left(\frac{5}{12}\right) = 22.6^\circ$
- Simplify $\frac{1 - \sin^2 x}{\cos x}$. $\frac{\cos^2 x}{\cos x} = \cos x$
- Simplify $\cos x + \tan x \sin x$.

$$\cos x + \frac{\sin x}{\cos x} (\sin x) = \frac{\cos x}{\cos x} \frac{\cos^2 x}{1} + \frac{\sin^2 x}{\cos x} = \frac{\cos^2 x + \sin^2 x}{\cos x} = \frac{1}{\cos x} = \sec x$$

22.) Simplify $\sin 100 \cos 40 - \cos 100 \sin 40 = \sin(100 - 40) = \boxed{\sin 60}$

For questions 23 – 24. Find the exact value of the trig function if $\sin u = 4/5$, where $0 \leq u \leq \frac{\pi}{2}$, and $\cos v = -5/13$, where $\pi \leq v \leq \frac{3\pi}{2}$.



23.) Evaluate $\cos(u - v)$.

$\cos u \cos v + \sin u \sin v = \left(\frac{3}{5}\right)\left(-\frac{5}{13}\right) + \left(\frac{4}{5}\right)\left(-\frac{12}{13}\right) = -\frac{15}{65} - \frac{48}{65} = \boxed{-\frac{63}{65}}$

24.) Evaluate $\sin 2u$.

$2 \sin u \cos u = 2\left(\frac{4}{5}\right)\left(\frac{3}{5}\right) = \boxed{\frac{24}{25}}$

25.) If angle A is 58 degrees, side a is 4.5, and side b is 5, find the measure of angle B.

$\frac{\sin 58}{4.5} = \frac{\sin B}{5}$ $\sin B = .9423$
 $B = \sin^{-1}(.9423)$

$B = \boxed{70.4^\circ}$

26.) If angle A is 84.3 degrees, angle C is 54.6 degrees, and side b is 2.68, find side a.

angle B = $180 - 84.3 - 54.6 = 41.1$ $\frac{\sin 41.1}{2.68} = \frac{\sin 84.3}{a}$

$a = \boxed{4.06}$

27.) Find the area of triangle ABC if angle A is 86 degrees, side b is 10, and side c is 8.

$A_{\Delta} = \frac{1}{2}(10)(8)\sin 86 = \boxed{39.9 \text{ units}^2}$

28.) For the triangle ABC (not a right triangle), let side b = 12, side c = 7, and $\angle A = 84^\circ$. Find side a to the nearest tenth.

$a^2 = 12^2 + 7^2 - 2(12)(7)\cos 84 \Rightarrow \sqrt{a^2} = \sqrt{175.4}$ $a = \boxed{13.2}$

29.) For the triangle ABC (not a right triangle), let side a = 11.2, side b = 8.4, and side c = 6.0. Find the measure of the largest angle to the nearest tenth.

$11^2 = 8.4^2 + 6.0^2 - 2(8.4)(6)\cos A$ $A = \boxed{98.2^\circ}$

30.) Find the area of the triangle in problem #29.

$A_{\Delta} = \frac{1}{2}bc \sin A = \frac{1}{2}(8.4)(6)\sin 98.2^\circ \approx 24.9$

OR

$A_{\Delta} = \sqrt{12.8(12.8 - 11.2)(12.8 - 8.4)(12.8 - 6)} \approx 24.8$

$s = \frac{11.2 + 8.4 + 6}{2}$

$s = 12.8$