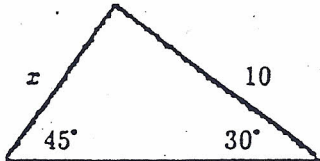
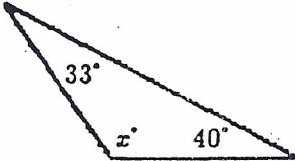


SAMPLE PLACEMENT TEST TO BYPASS MATH 1302
Department of Applied Mathematical Sciences, University of Houston-Downtown

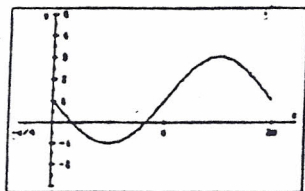
1. Find the other five trigonometric functions of θ using the given information.
 $\tan \theta = \frac{5}{12}$; $\sin \theta > 0$
2. How far are you from the base of a tree 100 ft. tall if the angle of elevation to the top of the tree is 30° ?
3. Graph exactly one period of each of the following functions.
 A. $y = 2 \sin x + 1$ B. $y = \tan x$ C. $y = \cos 2x - 2$
4. Prove the following identities by converting one side into the other.
 A. $\sec x + \tan x = \frac{\csc x + 1}{\csc x \cos x}$ B. $2 - \sin^2 \theta = 1 + \cos^2 \theta$
 C. $\frac{1}{1 + \cos y} + \frac{1}{1 - \cos y} = 2 \csc^2 y$
5. Find the value of each of the following expressions.
 A. $\text{Arcsin } \frac{1}{2}$ B. $\text{Cos}^{-1} \frac{\sqrt{2}}{2}$ C. $\cos^2 15^\circ + \sin^2 15^\circ$
 D. $\csc 60^\circ$ E. $\tan [\sec^{-1}(-3)]$ F. $\cot \frac{\pi}{4}$
6. Solve the following equations for all x such that $0 \leq x < 2\pi$.
 A. $2 \cos x \sin x = \sin x$ B. $\sec^2 x - \sec x - 2 = 0$
 C. $\cos^2 x = \frac{1}{2}$
7. Solve the following triangles for the unknown quantity.
 A. 
 B. 
8. For the polar equation $r = 2 - 3 \sin \theta$, find the missing coordinate of the following points so that the resulting point will be in the graph of this equation.
 A. $(?, \frac{5\pi}{4})$ B. $(2, ?)$ C. $(?, \frac{3\pi}{2})$
9. Change the polar coordinates $(-3, \frac{5\pi}{4})$ to rectangular coordinates.

ANSWERS FOR SAMPLE PLACEMENT TEST TO BYPASS MATH 1302

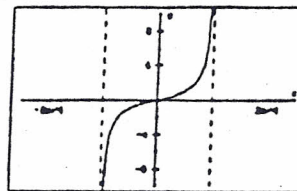
1. $\sin \theta = \frac{5}{13}$, $\csc \theta = \frac{13}{5}$, $\cos \theta = \frac{12}{13}$, $\sec \theta = \frac{13}{12}$, $\tan \theta = \frac{12}{13}$, $\cot \theta = \frac{13}{12}$

2. distance = $100\sqrt{3}$

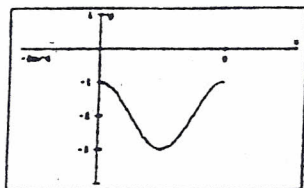
3. A.



B.



C.



5. A. $\arcsin \frac{1}{2} = 30^\circ$ or $\frac{\pi}{6}$ B. $\cos^{-1} \frac{\sqrt{2}}{2} = 45^\circ$ or $\frac{\pi}{4}$ C. $\cos^2 15^\circ + \sin^2 15^\circ = 1$
 D. $\csc 60^\circ = \frac{2\sqrt{3}}{3}$ E. $\tan [\sec^{-1}(-3)] = -2\sqrt{2}$ F. $\cot \frac{\pi}{4} = 1$

6. A. $x = 0^\circ, 60^\circ, 180^\circ, 300^\circ$ or $x = 0, \frac{\pi}{3}, \pi, \frac{5\pi}{3}$ B. $x = 60^\circ, 180^\circ, 300^\circ$ or $x = \frac{\pi}{3}, \pi, \frac{5\pi}{3}$
 C. $x = 45^\circ, 135^\circ, 225^\circ, 315^\circ$ or $x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

7. A. $x = 5\sqrt{6}$ B. $x^\circ = 107^\circ$

8. A. $\frac{4-3\sqrt{2}}{2}$ B. $0, \pm\pi, \pm2\pi, \pm3\pi, \dots$ C. 5

9. $(\frac{3\sqrt{2}}{2}, \frac{3\sqrt{2}}{2})$