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PLANE TRIGONOMETRY
EXAM I
June 18, 2007

There are 10 questions and each worth 10 points. Solve the problems in the space provided. **Show all your work for full points**. Sign and submit your formula sheet with the exam.

1. Convert the unit as indicated,
   a) 19.37° to degrees, minutes and seconds.

   b) $\frac{7\pi}{27}$ (radians) to degrees, minutes and seconds.

2. Find one positive coterminal angle and two negative coterminal angles for each of the following.
   a) 260° (use degrees)

   b) $\frac{11\pi}{7}$ (use radians)

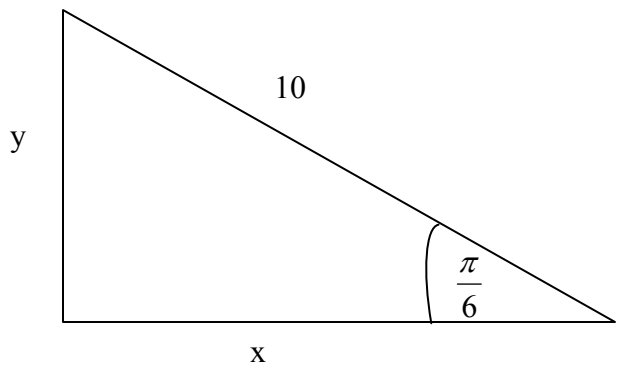
3. Find the length of the arc that subtends the central angle $\theta = 50^\circ$ on a circle of diameter 16 m. Also find the area of the sector determined by θ.

4. Find the values of the trigonometric functions $\sin t, \tan t, \csc t$ for the given condition $\cos t = \frac{-1}{3}$ *and* $\sin t < 0$.

5. Verify the identities by transforming the left side into the right side

a) $\frac{\cot t - 1}{1 - \tan t} = \cot t$ *b*) $\frac{1 + \cos^2 3t}{\sin^2 3t} = 2\csc^2 3t - 1$.

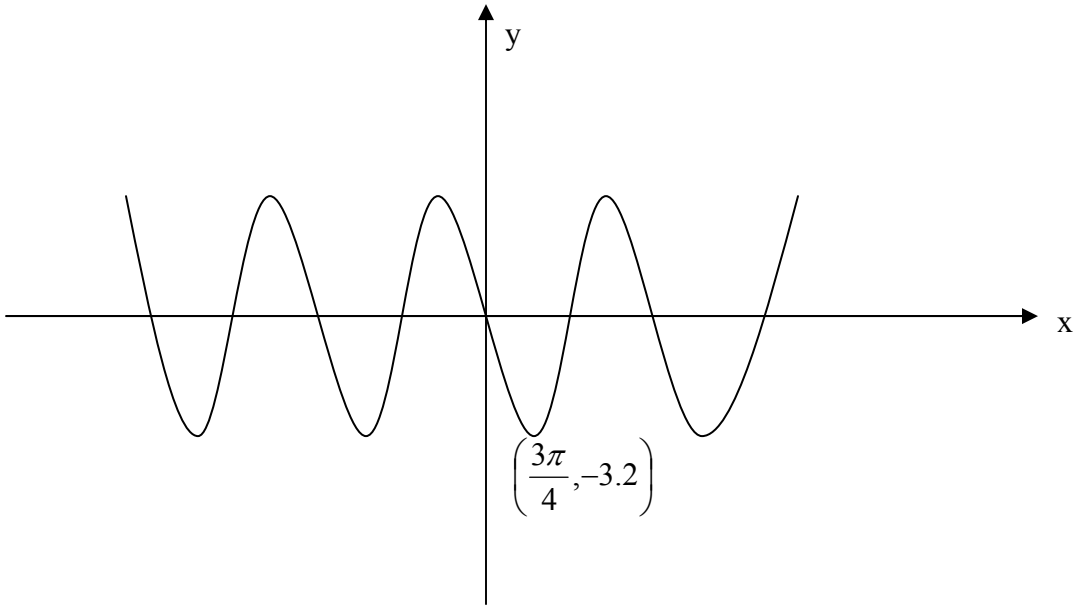
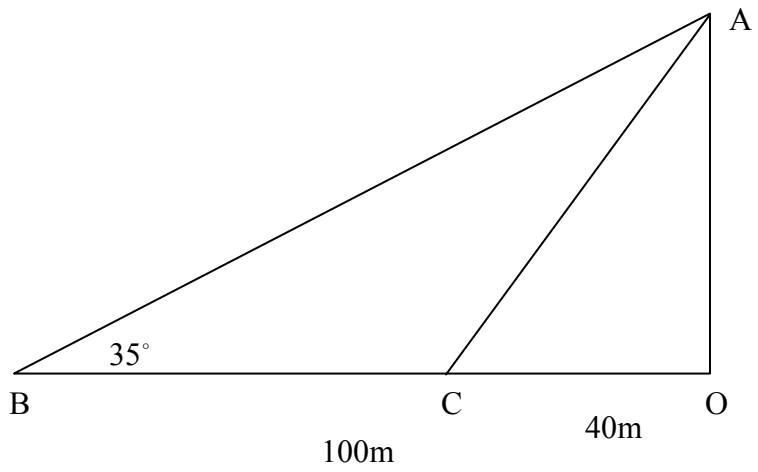
6. Find the exact values of x and y,



7. Find the reference angle for $\frac{4\pi}{3}$ and 150°. Hence find $\sec\frac{4\pi}{3}$ and $\tan 150^\circ$.

8. Sketch the graph of the equation $y = -2\cos\left(\frac{\pi}{2}x - \frac{\pi}{4}\right) + 1$ by giving the amplitude, period and the phase shift.

9. Express the equation in the form $y = a\sin bx$ of the following graph.



10. As in the figure a man see the top A, of a tower OA from B, 100m away from the base O of an angle of elevation 35°. Find the angle of elevation when he is of C, 40m from the base O. (Hint : find the height of the tower OA first)