

PRECALCULUS QUIZ #2 SOLUTIONS

#1 DERIVE THE QUADRATIC FORMULA.

SEE THE TUTORIAL FOR THE QUADRATIC FORMULA IN THE TUTORIALS SECTION OF [TEXTPONENT.COM](http://textponent.com)

#2 CONVERT $25^{\circ}12'45''$ TO DECIMAL NOTATION

$$12' = 12' \left(\frac{1^{\circ}}{60'} \right) = \left(\frac{12}{60} \right)^{\circ} = \left(\frac{1}{5} \right)^{\circ} = 0.20^{\circ}$$

$$45'' = 45'' \left(\frac{1'}{60''} \right) \left(\frac{1^{\circ}}{60'} \right) = \left(\frac{45}{3600} \right)^{\circ} = \left(\frac{1}{80} \right)^{\circ} = 0.0125^{\circ}$$

$$\begin{array}{r} 0.0125 \\ 80 \overline{) 1.0000} \\ \underline{0} \\ 10 \\ \underline{0} \\ 100 \\ \underline{80} \\ 200 \\ \underline{160} \\ 400 \\ \underline{400} \\ 0 \end{array}$$

$$\Rightarrow 25^{\circ}12'45'' = 25^{\circ} + 12' + 45''$$

$$= 25^{\circ} + 0.20^{\circ} + 0.0125^{\circ}$$

$$= 25.2125^{\circ} = 25^{\circ}12'45''$$

#3 CONVERT 36.4° TO D°M'S" NOTATION

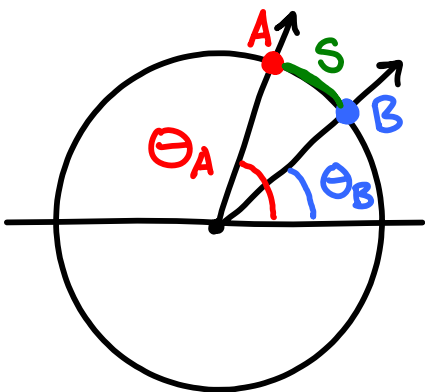
$$0.4^\circ = 0.4^\circ \left(\frac{60'}{1^\circ} \right) = (0.4)60' = \left(\frac{4}{10} \right)60' = 24'$$

$$\Rightarrow 36.4^\circ = 36^\circ + 0.4^\circ = 36^\circ + 24' = \boxed{36^\circ 24' = 36.4^\circ}$$

#4 IF CITY A IS DUE NORTH OF CITY B AND CITY A HAS LATITUDE $\theta_A = 78^\circ 45'$ AND CITY B HAS LATITUDE $\theta_B = 48^\circ 15'$

FIND THE DISTANCE BETWEEN THE TWO CITIES ALONG THE SURFACE OF THE EARTH.

(RADIUS OF EARTH $R_E = 2960$ miles)



$$S = r\theta = r(\theta_A - \theta_B)$$

$$= r(78^\circ 45' - 48^\circ 15')$$

$$= r(30^\circ 30') = r(30.5^\circ)$$

$$= r(30.5^\circ) \left(\frac{\pi}{180^\circ} \right) = r \left(\frac{61}{2} \right) \left(\frac{\pi}{180} \right)$$

$$= r \frac{61\pi}{360} = \frac{2960 \cdot 61\pi}{360} \text{ miles} *$$

THIS IS
GOOD
ENOUGH

$$= \frac{296 \cdot 61\pi}{36} \text{ miles}$$

$$\begin{array}{r} 296 \\ 61 \\ \hline 296 \\ 17760 \\ \hline 18056 \end{array}$$

$$= \frac{18056}{36} \pi \text{ miles} = \frac{4514}{9} \pi \text{ miles} = S$$