Answer on Question #82862 – Math – Calculus

Question

Example:

Tan2°=sin2°

Here if the theta is less than 4°

Why tan(theta)=sin(theta)

Again

What will happen if the theta is more than 4°

Solution

As we know

$$\tan\theta = \frac{\sin\theta}{\cos\theta}.$$

Since

$$\lim_{\theta\to 0}\cos\theta = 1,$$

we can assume

$$\tan\theta = \sin\theta$$

at small values of θ. Since $\cos 4^\circ = 0.998$, the accuracy of this approach is 0.2%. If $\theta > 4^\circ$ then $\cos\theta$ decreases resulting in increasing $\tan\theta$ over $\sin\theta$ (see the Figure below).