

11 Since $\sin \theta$ is negative and $\cos \theta$ is positive, θ is in quadrant IV. One possibility is shown in *Figure 11a*.

We see that $\cos \theta = \frac{7}{25}$.

$$(a) \sin 2\theta = 2 \sin \theta \cos \theta = 2 \left(-\frac{24}{25} \right) \left(\frac{7}{25} \right) = -\frac{336}{625}$$

$$\cos 2\theta = \cos^2 \theta - \sin^2 \theta = \left(\frac{7}{25} \right)^2 - \left(-\frac{24}{25} \right)^2 = \frac{49 - 576}{625} = -\frac{527}{625}$$

$$\tan 2\theta = \frac{\sin 2\theta}{\cos 2\theta} = \frac{-\frac{336}{625}}{-\frac{527}{625}} = -\frac{336}{625} \cdot \left(-\frac{625}{527} \right) = \frac{336}{527}$$

(b) Since θ is in quadrant IV, $\theta = \sin^{-1} \left(-\frac{24}{25} \right)$. Numerical support is shown in *Figures 11b* and *11c*.

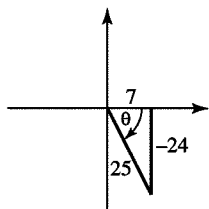


Figure 11a

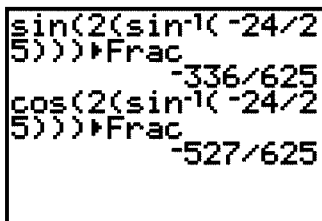


Figure 11b

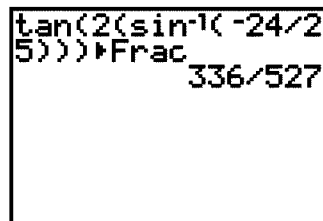


Figure 11c