$$\cos(2\theta) = \cos^2\theta - \sin^2\theta$$

$$\cos(2\theta) = 1 - 2\sin^2\theta$$

$$\cos(2\theta) = 2\cos^2\theta - 1$$

$$\sin(2\theta) = 2\sin\theta\cos\theta$$

$$\tan(2\theta) = \frac{2\tan\theta}{1 - 2\tan\theta}$$

Derivation page 1 how double ange formulas come from sum/difference formulas
(something you could do):

$$\cos(\theta+\theta)=\cos(2\theta)=\cos\theta\cos\theta-\sin\theta\sin\theta=\cos^2\theta-\sin^2\theta$$

$$\cos^2-\sin^2\theta=1-\sin^2\theta-\sin^2\theta=1-2\sin^2\theta$$

$$\cos^2-\sin^2\theta=\cos^2\theta-\left(1-\cos^2\theta\right)=2\cos^2\theta-1$$

$$\sin(\theta+\theta)=\sin(2\theta)=\sin\theta\cos\theta+\cos\theta\sin\theta=2\sin\theta\cos\theta$$

$$\tan(\theta+\theta)=\tan(2\theta)=\frac{\tan\theta+\tan\theta}{1-\tan\theta\tan\theta}=\frac{2\tan\theta}{1-2\tan\theta}$$

$$\textit{Find} \quad \sin(2\theta)$$

$$\sin\theta = -\frac{\sqrt{3}}{3}, \quad \frac{3\pi}{2} < \theta < 2\pi$$

- Recognize the patterns of the formulas

- Use the substitution trick:

$A=2\theta$