

Double and Half Angle Formulas Examples

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Use a double-angle identity to find the exact value of each expression.

1) $\cos \theta = -\frac{24}{25}$ and $\frac{\pi}{2} < \theta < \pi$

Find $\sin 2\theta$

2) $\sin \theta = \frac{\sqrt{403}}{22}$ and $\frac{\pi}{2} < \theta < \pi$

Find $\tan 2\theta$

3) $\cos \theta = -\frac{15}{17}$ and $\frac{\pi}{2} < \theta < \pi$

Find $\cos 2\theta$

4) $\cos \theta = -\frac{4}{5}$ and $\frac{\pi}{2} < \theta < \pi$

Find $\sin 2\theta$

Use a half-angle identity to find the exact value of each expression.

5) $\cos \theta = \frac{4}{5}$ and $\frac{3\pi}{2} < \theta < 2\pi$

Find $\cos \frac{\theta}{2}$

6) $\cos \theta = -\frac{4}{5}$ and $\pi < \theta < \frac{3\pi}{2}$

Find $\sin \frac{\theta}{2}$

7) $\sin \theta = -\frac{1}{3}$ and $\pi < \theta < \frac{3\pi}{2}$

Find $\tan \frac{\theta}{2}$

8) $\sin \theta = -\frac{2\sqrt{11}}{11}$ and $\pi < \theta < \frac{3\pi}{2}$

Find $\cos \frac{\theta}{2}$

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Use a double-angle identity to find the exact value of each expression.

1) $\cos \theta = -\frac{24}{25}$ and $\frac{\pi}{2} < \theta < \pi$

Find $\sin 2\theta$

$$-\frac{336}{625}$$

2) $\sin \theta = \frac{\sqrt{403}}{22}$ and $\frac{\pi}{2} < \theta < \pi$

Find $\tan 2\theta$

$$\frac{9\sqrt{403}}{161}$$

3) $\cos \theta = -\frac{15}{17}$ and $\frac{\pi}{2} < \theta < \pi$

Find $\cos 2\theta$

$$\frac{161}{289}$$

4) $\cos \theta = -\frac{4}{5}$ and $\frac{\pi}{2} < \theta < \pi$

Find $\sin 2\theta$

$$-\frac{24}{25}$$

Use a half-angle identity to find the exact value of each expression.

5) $\cos \theta = \frac{4}{5}$ and $\frac{3\pi}{2} < \theta < 2\pi$

Find $\cos \frac{\theta}{2}$

$$-\frac{3\sqrt{10}}{10}$$

6) $\cos \theta = -\frac{4}{5}$ and $\pi < \theta < \frac{3\pi}{2}$

Find $\sin \frac{\theta}{2}$

$$\frac{3\sqrt{10}}{10}$$

7) $\sin \theta = -\frac{1}{3}$ and $\pi < \theta < \frac{3\pi}{2}$

Find $\tan \frac{\theta}{2}$

$$-3 - 2\sqrt{2}$$

8) $\sin \theta = -\frac{2\sqrt{11}}{11}$ and $\pi < \theta < \frac{3\pi}{2}$

Find $\cos \frac{\theta}{2}$

$$-\frac{\sqrt{242 - 22\sqrt{77}}}{22}$$