

Evaluating Double Angles and Sum/Difference

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

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

Find $\cos 2\theta$

2) $\cos \theta = \frac{15}{17}$ and $0^\circ < \theta < 90^\circ$

Find $\sin 2\theta$

3) $\cos \theta = \frac{24}{25}$ and $\frac{3\pi}{2} < \theta < 2\pi$

Find $\cos 2\theta$

4) $\cos \theta = \frac{1}{2}$ and $270^\circ < \theta < 360^\circ$

Find $\cos 2\theta$

5) $\cos \theta = -\frac{4}{5}$ and $180^\circ < \theta < 270^\circ$

Find $\sin 2\theta$

6) $\cos \theta = \frac{4\sqrt{19}}{19}$ and $\frac{3\pi}{2} < \theta < 2\pi$

Find $\sin 2\theta$

7) $\cos \theta = -\frac{4}{5}$ and $90^\circ < \theta < 180^\circ$

Find $\sin 2\theta$

8) $\cos \theta = -\frac{4}{5}$ and $180^\circ < \theta < 270^\circ$

Find $\cos 2\theta$

9) $\cos \theta = \frac{15}{17}$ and $270^\circ < \theta < 360^\circ$

Find $\cos 2\theta$

10) $\cos \theta = -\frac{24}{25}$ and $\pi < \theta < \frac{3\pi}{2}$

Find $\sin 2\theta$

11) $\tan \theta = -\frac{8}{15}$ and $90^\circ < \theta < 180^\circ$

Find $\cos 2\theta$

12) $\tan \theta = \frac{4}{3}$ and $0^\circ < \theta < 90^\circ$

Find $\cos 2\theta$

13) $\csc \theta = \frac{17}{8}$ and $0^\circ < \theta < 90^\circ$

Find $\sin 2\theta$

14) $\cot \theta = -\frac{\sqrt{2}}{4}$ and $90^\circ < \theta < 180^\circ$

Find $\sin 2\theta$

15) $\sec \theta = -\frac{17}{15}$ and $180^\circ < \theta < 270^\circ$

Find $\sin 2\theta$

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

Find $\sin 2\theta$

17) $\csc \theta = -\frac{5}{3}$ and $180^\circ < \theta < 270^\circ$

Find $\cos 2\theta$

18) $\cos \theta = \frac{3\sqrt{13}}{13}$ and $0 < \theta < \frac{\pi}{2}$

Find $\cos 2\theta$

19) $\tan \theta = -\frac{2\sqrt{6}}{3}$ and $\frac{3\pi}{2} < \theta < 2\pi$

Find $\sin 2\theta$

20) $\cos \theta = \frac{\sqrt{33}}{11}$ and $0^\circ < \theta < 90^\circ$

Find $\tan 2\theta$

Use the angle sum or difference identity to find the exact value of each.

21) $\cos 75^\circ$

22) $\cos 105^\circ$

23) $\cos 15^\circ$

24) $\cos \frac{5\pi}{12}$

25) $\sin \frac{7\pi}{12}$

26) $\sin \frac{19\pi}{12}$

27) $\cos \frac{5\pi}{12}$

28) $\sin 165^\circ$

29) $\sin \frac{5\pi}{12}$

30) $\sin 195^\circ$

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

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

Find $\cos 2\theta$

$$\frac{7}{25}$$

2) $\cos \theta = \frac{15}{17}$ and $0^\circ < \theta < 90^\circ$

Find $\sin 2\theta$

$$\frac{240}{289}$$

3) $\cos \theta = \frac{24}{25}$ and $\frac{3\pi}{2} < \theta < 2\pi$

Find $\cos 2\theta$

$$\frac{527}{625}$$

4) $\cos \theta = \frac{1}{2}$ and $270^\circ < \theta < 360^\circ$

Find $\cos 2\theta$

$$-\frac{1}{2}$$

5) $\cos \theta = -\frac{4}{5}$ and $180^\circ < \theta < 270^\circ$

Find $\sin 2\theta$

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

6) $\cos \theta = \frac{4\sqrt{19}}{19}$ and $\frac{3\pi}{2} < \theta < 2\pi$

Find $\sin 2\theta$

$$-\frac{8\sqrt{3}}{19}$$

7) $\cos \theta = -\frac{4}{5}$ and $90^\circ < \theta < 180^\circ$

Find $\sin 2\theta$

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

8) $\cos \theta = -\frac{4}{5}$ and $180^\circ < \theta < 270^\circ$

Find $\cos 2\theta$

$$\frac{7}{25}$$

9) $\cos \theta = \frac{15}{17}$ and $270^\circ < \theta < 360^\circ$

Find $\cos 2\theta$

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

10) $\cos \theta = -\frac{24}{25}$ and $\pi < \theta < \frac{3\pi}{2}$

Find $\sin 2\theta$

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

11) $\tan \theta = -\frac{8}{15}$ and $90^\circ < \theta < 180^\circ$

Find $\cos 2\theta$

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

12) $\tan \theta = \frac{4}{3}$ and $0^\circ < \theta < 90^\circ$

Find $\cos 2\theta$

$$-\frac{7}{25}$$

13) $\csc \theta = \frac{17}{8}$ and $0^\circ < \theta < 90^\circ$

Find $\sin 2\theta$

$$\frac{240}{289}$$

14) $\cot \theta = -\frac{\sqrt{2}}{4}$ and $90^\circ < \theta < 180^\circ$

Find $\sin 2\theta$

$$-\frac{4\sqrt{2}}{9}$$

$$15) \sec \theta = -\frac{17}{15} \text{ and } 180^\circ < \theta < 270^\circ$$

Find $\sin 2\theta$

$$\frac{240}{289}$$

$$16) \sec \theta = \frac{5}{4} \text{ and } \frac{3\pi}{2} < \theta < 2\pi$$

Find $\sin 2\theta$

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

$$17) \csc \theta = -\frac{5}{3} \text{ and } 180^\circ < \theta < 270^\circ$$

Find $\cos 2\theta$

$$\frac{7}{25}$$

$$18) \cos \theta = \frac{3\sqrt{13}}{13} \text{ and } 0 < \theta < \frac{\pi}{2}$$

Find $\cos 2\theta$

$$\frac{5}{13}$$

$$19) \tan \theta = -\frac{2\sqrt{6}}{3} \text{ and } \frac{3\pi}{2} < \theta < 2\pi$$

Find $\sin 2\theta$

$$-\frac{4\sqrt{6}}{11}$$

$$20) \cos \theta = \frac{\sqrt{33}}{11} \text{ and } 0^\circ < \theta < 90^\circ$$

Find $\tan 2\theta$

$$-\frac{4\sqrt{6}}{5}$$

Use the angle sum or difference identity to find the exact value of each.

$$21) \cos 75^\circ$$

$$\frac{\sqrt{6} - \sqrt{2}}{4}$$

$$22) \cos 105^\circ$$

$$\frac{\sqrt{2} - \sqrt{6}}{4}$$

$$23) \cos 15^\circ$$

$$\frac{\sqrt{6} + \sqrt{2}}{4}$$

$$24) \cos \frac{5\pi}{12}$$

$$\frac{\sqrt{6} - \sqrt{2}}{4}$$

$$25) \sin \frac{7\pi}{12}$$

$$\frac{\sqrt{6} + \sqrt{2}}{4}$$

$$26) \sin \frac{19\pi}{12}$$

$$\frac{-\sqrt{6} - \sqrt{2}}{4}$$

$$27) \cos \frac{5\pi}{12}$$

$$\frac{\sqrt{6} - \sqrt{2}}{4}$$

$$28) \sin 165^\circ$$

$$\frac{\sqrt{6} - \sqrt{2}}{4}$$

$$29) \sin \frac{5\pi}{12}$$

$$\frac{\sqrt{6} + \sqrt{2}}{4}$$

$$30) \sin 195^\circ$$

$$\frac{\sqrt{2} - \sqrt{6}}{4}$$