

Double-Angle and Half-Angle Identities Assignment

Fill the blanks with correct angles using Double -Angle Identities.

1. $\sin(90^\circ) = 2\sin(\text{_____})\cos(\text{_____})$

2. $\sin(\text{_____}) = 2\cos(20^\circ)\sin(20^\circ)$

3. $\cos(60^\circ) = \cos^2(\text{_____}) - \sin^2(\text{_____})$

4. $\cos(\text{_____}) = \text{_____} - 2\sin^2(35^\circ)$

5. $\tan(30^\circ) = \frac{2\tan(\text{_____})}{1-\tan^2(\text{_____})}$

6. $\tan(\text{_____}) = \frac{2\tan(40^\circ)}{1-\tan^2(40^\circ)}$

Fill the blanks with correct angles using Half-Angle Identities.

1. $\cos(46^\circ) = \sqrt{\frac{1+\cos(\text{_____})}{2}}$

2. $\sin(\text{_____}) = \sqrt{\frac{1-\cos(100^\circ)}{2}}$

3. $\tan(\text{_____}) = \sqrt{\frac{1-\cos(170^\circ)}{1+\cos(170^\circ)}}$

Double-Angle and Half-Angle Identities Assignment

Given that $\tan(\theta) = \frac{x}{y}$, find the following if θ is in the first quadrant:

1. $\sin(2\theta) =$ _____

2. $\cos(2\theta) =$ _____

3. $\tan(2\theta) =$ _____

Find the following using the half-angle identities:

1. $\sin\left(\frac{\pi}{8}\right) =$ _____

2. $\cos\left(\frac{\pi}{8}\right) =$ _____

3. $\tan\left(\frac{\pi}{8}\right) =$ _____

Identify whether the given identity is true or false?

1. $\tan\left(\frac{\theta}{2}\right) = \frac{1-\cos(\theta)}{\sin(\theta)}$

a. True

b. False

2. $\operatorname{cosec}(2B) - \cot(2B) = \tan(B)$

a. True

b. False

Double-Angle and Half-Angle Identities Assignment

Fill the blanks with correct angles using Double-Angle Identities.

1. $\sin(90^\circ) = 2\sin(\underline{45^\circ})\cos(\underline{45^\circ})$

2. $\sin(\underline{40^\circ}) = 2\cos(20^\circ)\sin(20^\circ)$

3. $\cos(60^\circ) = \cos^2(\underline{30^\circ}) - \sin^2(\underline{30^\circ})$

4. $\cos(\underline{70^\circ}) = \underline{1} - 2\sin^2(35^\circ)$

5. $\tan(30^\circ) = \frac{2\tan(\underline{15^\circ})}{1-\tan^2(\underline{15^\circ})}$

6. $\tan(\underline{80^\circ}) = \frac{2\tan(40^\circ)}{1-\tan^2(40^\circ)}$

Fill the blanks with correct angles using Half-Angle Identities.

4. $\cos(46^\circ) = -\sqrt{\frac{1+\cos(\underline{92^\circ})}{2}}$

5. $\sin(\underline{50^\circ}) = \sqrt{\frac{1-\cos(100^\circ)}{2}}$

6. $\tan(\underline{85^\circ}) = \sqrt{\frac{1-\cos(170^\circ)}{1+\cos(170^\circ)}}$

Double-Angle and Half-Angle Identities Assignment

Given that $\tan(\theta) = \frac{x}{y}$, find the following if θ is in the first quadrant:

4. $\sin(2\theta) = \frac{2xy}{x^2+y^2}$

5. $\cos(2\theta) = \frac{(x^2-y^2)^2}{(x^2+y^2)^2}$

6. $\tan(2\theta) = \frac{2xy}{y^2-x^2}$

Find the following using the half-angle identities:

4. $\sin\left(\frac{\pi}{8}\right) = \frac{\sqrt{2-\sqrt{2}}}{2}$

5. $\cos\left(\frac{\pi}{8}\right) = \frac{\sqrt{2+\sqrt{2}}}{2}$

6. $\tan\left(\frac{\pi}{8}\right) = \frac{\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}}$

Identify whether the given identity is true or false?

3. $\tan\left(\frac{\theta}{2}\right) = \frac{1-\cos(\theta)}{\sin(\theta)}$

a. True

b. False

4. $\operatorname{cosec}(2B) - \cot(2B) = \tan(B)$

a. True

b. False