Unit 4.3 Sum and Difference Identities (Sine & Cosine) PRACTICE

Simplify.

1) $\cos 6u \cos -3u - \sin 6u \sin -3u$

$\cos 3u$

2) $\cos x \cos x - \sin x \sin x$

$\cos 2x$

3) $\cos -3v \cos 3v + \sin -3v \sin 3v$

$\cos -6v$

4) $\cos -4\theta \cos -5\theta - \sin -4\theta \sin -5\theta$

$\cos -9\theta$

5) $\sin 6v \cos -2v + \cos 6v \sin -2v$

$\sin 4v$

6) $\cos -4v \cos -3v + \sin -4v \sin -3v$

$\cos -v$

7) $\sin 3v \cos -4v + \cos 3v \sin -4v$

$\sin -v$

8) $\sin 4\theta \cos 2\theta - \cos 4\theta \sin 2\theta$

$\sin 2\theta$

9) $\sin -6v \cos -2v + \cos -6v \sin -2v$

$\sin -8v$

10) $\sin 6u \cos -3u + \cos 6u \sin -3u$

$\sin 3u$

11) $\sin -6v \cos -6v + \cos -6v \sin -6v$

$\sin -12v$

12) $\cos v \cos -3v - \sin v \sin -3v$

$\cos -2v$

Verify each identity.

13) $\cos\left(\theta + \frac{\pi}{2}\right) = -\sin\theta$

$\cos\left(\theta + \frac{\pi}{2}\right)$
$= \cos\theta\cos\frac{\pi}{2} - \sin\theta\sin\frac{\pi}{2}$
$= \cos\theta \cdot 0 - \sin\theta \cdot 1$
$= -\sin\theta$

14) $\cos(\theta - 270°) = -\sin\theta$

$\cos(\theta - 270°)$
$= \cos\theta\cos 270° + \sin\theta\sin 270°$
$= \cos\theta \cdot 0 + \sin\theta \cdot -1$
$= -\sin\theta$

15) $\sin(\theta + 90°) = \cos\theta$

$\sin(\theta + 90°)$
$= \sin\theta\cos 90° + \cos\theta\sin 90°$
$= \sin\theta \cdot 0 + \cos\theta \cdot 1$
$= \cos\theta$

16) $\sin(\theta - \pi) = -\sin\theta$

$\sin(\theta - \pi)$
$= \sin\theta\cos\pi - \cos\theta\sin\pi$
$= \sin\theta \cdot -1 - \cos\theta \cdot 0$
$= -\sin\theta$

17) $\sin(180° + \theta) = -\sin\theta$

$\sin(180° + \theta)$
$= \sin 180°\cos\theta + \cos 180°\sin\theta$
$= 0\cos\theta - \sin\theta$
$= -\sin\theta$

18) $\cos(270° + \theta) = \sin\theta$

$\cos(270° + \theta)$
$= \cos 270°\cos\theta - \sin 270°\sin\theta$
$= 0\cos\theta - -\sin\theta$
$= \sin\theta$

19) $\cos(\pi + \theta) = -\cos\theta$

$\cos(\pi + \theta)$
$= \cos\pi\cos\theta - \sin\pi\sin\theta$
$= -\cos\theta - 0\sin\theta$
$= -\cos\theta$

20) $\cos(\theta - 90°) = \sin\theta$

$\cos(\theta - 90°)$
$= \cos\theta\cos 90° + \sin\theta\sin 90°$
$= \cos\theta \cdot 0 + \sin\theta \cdot 1$
$= \sin\theta$

21) $\sin\left(\frac{3\pi}{2} + \theta\right) = -\cos\theta$

$\sin\left(\frac{3\pi}{2} + \theta\right)$
$= \sin\frac{3\pi}{2}\cos\theta + \cos\frac{3\pi}{2}\sin\theta$
$= -\cos\theta + 0\sin\theta$
$= -\cos\theta$

22) $\cos(\theta - 180°) = -\cos\theta$

$\cos(\theta - 180°)$
$= \cos\theta\cos 180° + \sin\theta\sin 180°$
$= \cos\theta \cdot -1 + \sin\theta \cdot 0$
$= -\cos\theta$

23) $\sin(270° - \theta) = -\cos\theta$

$\sin(270° - \theta)$
$= \sin 270°\cos\theta - \cos 270°\sin\theta$
$= -\cos\theta - 0\sin\theta$
$= -\cos\theta$

24) $\sin(180° - \theta) = \sin\theta$

$\sin(180° - \theta)$
$= \sin 180°\cos\theta - \cos 180°\sin\theta$
$= 0\cos\theta - -\sin\theta$
$= \sin\theta$