

Name _____ Date _____ Period _____

Worksheet 6.3—Composite Identities

Show all work. No Calculator, or course (unless you use the side of it as a straight-edge to draw your line down the equal sign.)

I. Multiple Choice

1. If $\cos A \cos B = \sin A \sin B$, then $\cos(A + B) =$
(A) 0 (B) 1 (C) $\cos A + \cos B$ (D) $\cos B - \cos A$ (E) $\cos A \cos B + \sin A \sin B$

2. If $\sin A \cos B = -\sin B \cos A$, then $\sin(A + B) =$
(A) 0 (B) 1 (C) $\cos A + \sin B$ (D) $\sin B - \cos A$ (E) $2 \sin A \cos B$

3. The function $f(x) = \sin x \cos 2x + \cos x \sin 2x$ has how many cycles from 0 to 2π ?
(A) 1 (B) 2 (C) $\frac{2\pi}{3}$ (D) 3 (E) 6

4. $\sin\left(-\frac{\pi}{12}\right) =$

- (A) -0.25 (B) $-\frac{\sqrt{3}}{4}$ (C) $-\frac{\sqrt{3}+\sqrt{2}}{4}$ (D) $\frac{\sqrt{2}-\sqrt{6}}{4}$ (E) $\frac{\sqrt{6}-\sqrt{2}}{4}$

5. $\sin 133^\circ \cos 58^\circ + \cos 133^\circ \sin 58^\circ =$

- (A) $\cos 75^\circ$ (B) $\sin 191^\circ$ (C) $\sin 75^\circ$ (D) $\cos 191^\circ$ (E) Peaches

II. Short answer

6. Find the exact value of each of the following using composite identities.

(a) $\sin \frac{5\pi}{12}$

(b) $\cos \frac{7\pi}{12}$

(c) $\tan \frac{11\pi}{12}$

7. Write each expression as the sine, cosine, or tangent of a **positive** angle.

$$(a) \sin \frac{2\pi}{13} \cos \frac{3\pi}{4} - \sin \frac{3\pi}{4} \cos \frac{2\pi}{13} =$$

$$(b) \frac{\tan \frac{\pi}{5} - \tan \frac{\pi}{3}}{1 + \tan \frac{\pi}{5} \tan \frac{\pi}{3}}$$

8. Express each function as a sinusoid in standard transformation form.

$$(a) f(x) = \sin 3x \cos 2 - \cos 3x \sin 2$$

$$(b) g(x) = 2 \cos 2 \cos 2x + 2 \sin 2 \sin 2x - 2$$

9. Prove each of the following:

$$(a) \cos\left(x - \frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}(\cos x + \sin x)$$

$$(b) \cos(x - y) + \cos(x + y) = 2 \cos x \cos y$$

$$(c) \sin 2x = 2 \sin x \cos x$$

$$(d) \sin(3u) = 3 \cos^2 u \sin u - \sin^3 u$$

(e) $\cos 3x + \cos x = 2 \cos 2x \cos x$

(f) $\cos 2x = \cos^2 x - \sin^2 x$

10. Let $\theta = \arccos x$. Write $\sin(2\arccos x)$ as an algebraic function.