Name_____

Double- and Half-Angle Identities

Date_____ Period____

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

1) $\sin 120°$

2) $\tan 60°$

3) $\cos \dfrac{4\pi}{3}$

4) $\sin \dfrac{5\pi}{3}$

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

5) $\tan 45°$

6) $\sin 165°$

7) $\sin \dfrac{5\pi}{6}$

8) $\cos 30°$

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

9) $\cot \dfrac{\pi}{3}$

10) $\cot \dfrac{2\pi}{3}$

11) $\sec \dfrac{5\pi}{12}$

12) $\cot 60°$

13) $\cot 240°$

14) $\cot \dfrac{5\pi}{3}$

15) $\sin\theta = -\dfrac{7}{25}$ and $270° < \theta < 360°$

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

16) $\cos\theta = \dfrac{1}{3}$ and $0° < \theta < 90°$

Find $\sin 2\theta$

17) $\cos\theta = \dfrac{4}{5}$ and $270° < \theta < 360°$

Find $\sin 2\theta$

18) $\cos\theta = \dfrac{2\sqrt{5}}{5}$ and $0° < \theta < 90°$

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

19) $\cos\theta = -\dfrac{4}{5}$ and $90° < \theta < 180°$

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

20) $\cos\theta = -\dfrac{15}{17}$ and $180° < \theta < 270°$

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

21) $\tan\theta = -\dfrac{7}{24}$ and $\dfrac{3\pi}{2} < \theta < 2\pi$

Find $\cot\dfrac{\theta}{2}$

22) $\cot\theta = \dfrac{4}{3}$ and $\pi < \theta < \dfrac{3\pi}{2}$

Find $\sin 2\theta$

23) $\cot\theta = \dfrac{4}{3}$ and $\pi < \theta < \dfrac{3\pi}{2}$

Find $\cot 2\theta$

24) $\tan\theta = 2$ and $0 < \theta < \dfrac{\pi}{2}$

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

25) $\sin\theta = -\dfrac{3}{5}$ and $\dfrac{3\pi}{2} < \theta < 2\pi$

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

26) $\cot\theta = -\dfrac{3\sqrt{91}}{91}$ and $\dfrac{3\pi}{2} < \theta < 2\pi$

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

Name_____

Double- and Half-Angle Identities

Date_____ Period____

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

1) $\sin 120°$

$$\frac{\sqrt{3}}{2}$$

2) $\tan 60°$

$$\sqrt{3}$$

3) $\cos \frac{4\pi}{3}$

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

4) $\sin \frac{5\pi}{3}$

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

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

5) $\tan 45°$

$$1$$

6) $\sin 165°$

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

7) $\sin \frac{5\pi}{6}$

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

8) $\cos 30°$

$$\frac{\sqrt{3}}{2}$$

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

9) $\cot \frac{\pi}{3}$

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

10) $\cot \frac{2\pi}{3}$

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

11) $\sec \frac{5\pi}{12}$

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

12) $\cot 60°$

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

13) $\cot 240°$

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

14) $\cot \frac{5\pi}{3}$

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

15) $\sin \theta = -\dfrac{7}{25}$ and $270° < \theta < 360°$

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

$-\dfrac{7\sqrt{2}}{10}$

16) $\cos \theta = \dfrac{1}{3}$ and $0° < \theta < 90°$

Find $\sin 2\theta$

$\dfrac{4\sqrt{2}}{9}$

17) $\cos \theta = \dfrac{4}{5}$ and $270° < \theta < 360°$

Find $\sin 2\theta$

$-\dfrac{24}{25}$

18) $\cos \theta = \dfrac{2\sqrt{5}}{5}$ and $0° < \theta < 90°$

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

$\dfrac{\sqrt{50 - 20\sqrt{5}}}{10}$

19) $\cos \theta = -\dfrac{4}{5}$ and $90° < \theta < 180°$

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

$\dfrac{3\sqrt{10}}{10}$

20) $\cos \theta = -\dfrac{15}{17}$ and $180° < \theta < 270°$

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

-4

21) $\tan \theta = -\dfrac{7}{24}$ and $\dfrac{3\pi}{2} < \theta < 2\pi$

Find $\cot \dfrac{\theta}{2}$

-7

22) $\cot \theta = \dfrac{4}{3}$ and $\pi < \theta < \dfrac{3\pi}{2}$

Find $\sin 2\theta$

$\dfrac{24}{25}$

23) $\cot \theta = \dfrac{4}{3}$ and $\pi < \theta < \dfrac{3\pi}{2}$

Find $\cot 2\theta$

$\dfrac{7}{24}$

24) $\tan \theta = 2$ and $0 < \theta < \dfrac{\pi}{2}$

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

$\dfrac{\sqrt{50 - 10\sqrt{5}}}{10}$

25) $\sin \theta = -\dfrac{3}{5}$ and $\dfrac{3\pi}{2} < \theta < 2\pi$

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

$-\dfrac{1}{3}$

26) $\cot \theta = -\dfrac{3\sqrt{91}}{91}$ and $\dfrac{3\pi}{2} < \theta < 2\pi$

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

$\dfrac{\sqrt{35}}{10}$