

Pre-AP Precal
Unit 5 Part 2 Review

Name _____

Date _____

1. If $\frac{\pi}{2} < \theta < \pi$ and $\sin \theta = \frac{2}{3}$, then $\sin 2\theta =$

- a) $-\frac{4\sqrt{5}}{9}$ b) $\frac{4\sqrt{5}}{9}$ c) $\frac{4}{3}$
d) $-\frac{4}{3}$ e) $\frac{4\sqrt{13}}{13}$

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

$$2 \left(\frac{2}{3}\right) \left(-\frac{\sqrt{5}}{3}\right)$$

$$= -\frac{4\sqrt{5}}{9}$$

2. If $\cos \theta = \frac{1}{8}$, the positive value of $\sin \frac{\theta}{2}$ is

- a) $\frac{3}{2}$ b) $\frac{\sqrt{7}}{4}$ c) $\frac{9}{16}$ d) $\frac{3}{4}$
- $$\sqrt{\frac{1}{2}(1-\frac{1}{8})} = \sqrt{\frac{1}{2}(\frac{7}{8})} = \sqrt{\frac{7}{16}} = \frac{\sqrt{7}}{4}$$

3. If $\cos A = \frac{1}{3}$, then the positive value of $\tan \frac{1}{2}A$ is

- a) $\sqrt{2}$ b) $\sqrt{3}$ c) $\frac{\sqrt{3}}{3}$ d) $\frac{\sqrt{2}}{2}$
- $$\tan \frac{1}{2}A = \frac{\sin A}{1 + \cos A} = \frac{\frac{\sqrt{2}\sqrt{2}}{3}}{1 + \frac{1}{3}} = \frac{\frac{2\sqrt{2}}{3}}{\frac{4}{3}} = \frac{\sqrt{2}}{2}$$

4. The expression $\frac{\sin 2A}{2 \cos^2 A}$ is equivalent to

- a) $\sin A$ b) $\tan A$ c) $\cot A$ d) $2 \tan A$
- $$\frac{2 \sin A \cos A}{2 \cos^2 A} = \tan A$$

5. Which trigonometric function is equivalent to the expression $\frac{\sin 2x}{2 \sin x}$?

- a) $\tan x$ b) $\cot x$ c) $\sin x$ d) $\cos x$

6. For all values of A for which the expressions are defined, $\frac{\sin 2A}{\cos A} - \sin A$ is equivalent to

- a) 1 b) $\cos A$ c) $\sin A$ d) $2 \sin A$
- $$\frac{2 \sin A \cos A}{\cos A} - \sin A = 2 \sin A - \sin A = \sin A$$

7. The expression $\sin A \cos A + \sin 2A$ is equivalent to

- a) $\sin A(\cos A + \sin A)$ b) $\cos A + 2 \sin A$
c) $3 \sin A \cos A$ d) $\cos A + 2 \sin 2A$

8. The expression $\frac{\sin 2x}{\sin(-x)}$ is equivalent to

- a) $-2 \sin x$ b) $2 \sin x$
c) $-2 \cos x$ d) $2 \cos x$

$$\frac{2 \sin x \cos x}{-\sin x}$$

$$-2 \cos x$$

9. In the interval $0 \leq \theta < 2\pi$, the number of solutions of the equation $\sin \theta = \cos \theta$ is

- a) 1 b) 2 c) 3 d) 4

$\sin \theta = \cos \theta$ both positive QI
both negative QIII

10. If $\tan \theta = \frac{1 + \sqrt{3}}{4}$, then angle θ may terminate in Quadrant

- a) I or III only b) II or IV only
c) III or IV only d) I, II, III, or IV

\tan is pos in QI, III

11. In the interval $0 \leq x < 2\pi$, the solutions of the equation $\sin^2 x = \sin x$ are

- a) $0, \frac{\pi}{2}, \pi$ b) $\frac{\pi}{2}, \frac{3\pi}{2}$ c) $0, \frac{\pi}{2}, \frac{3\pi}{2}$ d) $\frac{\pi}{2}, \pi, \frac{3\pi}{2}$
- $$\sin^2 x - \sin x = 0$$
- $$\sin x(\sin x - 1) = 0$$
- $$\sin x = 0$$
- $$\sin x - 1 = 0$$
- $$\sin x = 1$$
- $$0, \pi$$
- $$\frac{\pi}{2}$$

12. Solve for θ , where $(0 \leq \theta < 2\pi)$:

$$2 \sin^2 \theta + \sin \theta - 1 = 0$$

Exact values only.

- a) $0, \frac{\pi}{2}, \pi$ b) $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{3\pi}{2}$
c) $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$ d) $\frac{\pi}{6}, \frac{3\pi}{2}$
e) $0, \frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$
- $$(2 \sin \theta - 1)(\sin \theta + 1) = 0$$
- $$2 \sin \theta - 1 = 0$$
- $$\sin \theta + 1 = 0$$
- $$\sin \theta = -1$$
- $$\frac{3\pi}{2}$$



$$\textcircled{20} \quad (\sin x + \cos x)^2 = 2$$

$$\sin^2 x + 2\sin x \cos x + \cos^2 x = 2$$

$$\underline{\sin^2 x + \cos^2 x + 2\sin x \cos x = 2}$$

$$1 + \sin 2x = 2$$

$$\sin 2x = 1$$

$$\sin^{-1}(1) = 2x$$

$$\frac{\pi}{2} + 2\pi n = 2x$$

$$\frac{\pi}{4} + \pi n = x$$

$$\textcircled{21} \quad \frac{1}{1 - \tan x} \quad \text{undefined when } \tan x = 0$$

$$1 - \tan x = 0$$

$$1 = \tan x$$

$$\frac{\pi}{6}, \frac{\sqrt{3}}{2}$$

$$\textcircled{21} \quad \cos 2\theta + \sin 2\theta = -1$$

$$2\cos^2 \theta - 1 + 2\sin \theta \cos \theta = -1$$

$$2\cos^2 \theta + 2\sin \theta \cos \theta = 0$$

$$2\cos \theta (\cos \theta + \sin \theta) = 0$$

$$2\cos \theta = 0 \quad \cos \theta + \sin \theta = 0$$

$$\cos \theta = 0$$

$$\cos \theta = -\sin \theta$$

$\sin \theta = \cos \theta$ for 45° ref < (cofunction)

if $\cos \theta = -\sin \theta$, one must be + & one -
 $\sin & \cos$ are both + in QI & both - in QIII
 so must Q2 & Q4



$$135^\circ$$

$$315^\circ$$