

Name: \_\_\_\_\_  
Period: \_\_\_\_\_

Date: \_\_\_\_\_  
Trig: Chapter 6 Review

### Double Angle Formulas:

$$\sin 2\theta = \underline{\hspace{2cm}}$$

$$\cos 2\theta = \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

### The Chart!!

$\theta$	0	30	45	60	90
$\sin \theta$					
$\cos \theta$					
$\tan \theta$					

### Solving Trig Equations:

1.  $\sin x + 2 \sin x \cos x = 0$

2.  $\sin(3A + 30) = \frac{1}{2}$

3.  $2 \cos \theta + 1 = \sec \theta$

4.  $2 \sin x + \cot x - \csc x = 0$

5.  $\sin \theta - \sqrt{3} \cos \theta = \sqrt{3}$

6.  $\cos 2\theta = \frac{\sqrt{3}}{2}$  if  $0 \leq \theta < 360$

7.  $\tan 3x = 1$  if  $-\frac{\pi}{2} < x < \frac{\pi}{2}$

8.  $\sin 2x \cos x + \cos 2x \sin x = \frac{1}{\sqrt{2}}$  if  $0 \leq x \leq 2\pi$

9.  $2 \sin^2 3\theta - \sin 3\theta - 1 = 0$  if  $0 \leq \theta < 360$

10.  $\tan^2 3x = 1$  if  $-\frac{\pi}{2} < x < \frac{\pi}{2}$

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**Double Angle Formulas:**

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

$$\begin{aligned} \cos 2A &= 1 - 2 \sin^2 A \\ &= \cancel{2 \cos^2 A - 1} \\ &= \cos^2 A - \sin^2 A \end{aligned}$$

**The Chart!!**

$\theta$	0	30	45	60	90
$\sin \theta$	0	1/2	$\sqrt{2}/2$	$\sqrt{3}/2$	1
$\cos \theta$	1	$\sqrt{3}/2$	$\sqrt{2}/2$	1/2	0
$\tan \theta$	0	$\sqrt{3}/3$	1	$\sqrt{3}$	undefined

**Solving Trig Equations:**

1.  $\sin x + 2 \sin x \cos x = 0$   
 $\sin x (1 + 2 \cos x) = 0$   
 $\sin x = 0 \rightarrow \cos x = -\frac{1}{2}$   
 $x = 0, 180^\circ \quad x = 120^\circ, 240^\circ$

2.  $\sin(3x + 30) = \frac{1}{2}$

3.  $2 \cos \theta + 1 = \sec \theta$   
 $\cos \theta (2 \cos \theta + 1) = \frac{1}{\cos \theta}$   
 $2 \cos^2 \theta + \cos \theta = 1 = 0$   
 $(2 \cos \theta - 1)(\cos \theta + 1) = 0$   
 $\cos \theta = 1/2 \quad \cos \theta = -1$   
 $\theta = 60^\circ, 300^\circ \quad \theta = 180^\circ$

4.  $2 \sin x + \cot x - \csc x = 0$   
 $2 \sin x + \frac{\cos x}{\sin x} - \frac{1}{\sin x} = 0$   
 $2 \sin^2 x + \cos x - 1 = 0$   
 $2(1 - \cos^2 x) + \cos x - 1 = 0$   
 $2 - 2 \cos^2 x + \cos x - 1 = 0$   
 $2 \cos^2 x - \cos x - 1 = 0$   
 $(2 \cos x + 1)(\cos x - 1) = 0$   
 $\cos x = -\frac{1}{2}$   
 $x = 120^\circ, 240^\circ$   
 $x = 0$

5.  $\sin \theta - \sqrt{3} \cos \theta = \sqrt{3}$   
 $\sin \theta = \sqrt{3} + \sqrt{3} \cos \theta$   
 $\sin^2 \theta = 3 + 2\sqrt{3} \cos \theta + 3 \cos^2 \theta$   
 $1 - \cos^2 \theta = 3 + 6 \cos \theta + 3 \cos^2 \theta$   
 $\theta = 4 \cos^2 \theta + 6 \cos \theta + 2$   
 $\cos \theta = \frac{-6 \pm \sqrt{36 - 32}}{8}$   
 $\cos \theta = \frac{1}{2} \quad \cos \theta = -1$   
 $\theta = 120^\circ, 240^\circ, 180^\circ$

6.  $\cos 2\theta = \frac{\sqrt{3}}{2}$  if  $0 \leq \theta < 360$      $0 \leq 2\theta < 720$   
 $2\theta = 30, 330, 390, 690$   
 $\theta = 15^\circ, 165^\circ, 195^\circ, 345^\circ$

7.  $\tan 3x = 1$  if  $-\frac{\pi}{2} < x < \frac{\pi}{2} \rightarrow -\frac{3\pi}{2} < 3x < \frac{3\pi}{2}$   
 $3x = 45, 225, -135, -315$   
 $x = 15, 75, -45, -105$

8.  $\sin 2x \cos x + \cos 2x \sin x = \frac{1}{\sqrt{2}}$  if  $0 \leq x \leq 2\pi$   
 $\sin 3x = \frac{\sqrt{2}}{2}$      $0 \leq 3x \leq 6\pi$   
 $3x = 45^\circ, 135^\circ, 405^\circ, 495^\circ, 765^\circ, 855^\circ$   
 $x = 15^\circ, 45^\circ, 135^\circ, 165^\circ, 255^\circ, 285^\circ$

9.  $2 \sin^2 3\theta - \sin 3\theta - 1 = 0$  if  $0 \leq \theta < 360 \rightarrow 0 \leq 3\theta < 1080$   
 $(2 \sin 3\theta + 1)(\sin 3\theta - 1) = 0$   
 $\sin 3\theta = -\frac{1}{2} \quad \sin 3\theta = 1$   
 $3\theta = 210, 330, 90$   
 $\theta = 70^\circ, 110^\circ, 30^\circ$

10.  $\tan^2 3x = 1$  if  $-\frac{\pi}{2} < x < \frac{\pi}{2} \rightarrow -270 < x < 270$   
 $\tan 3x = \pm 1$   
 $3x = 45, 135, 225, -45, -135, -225$   
 $x = 15^\circ, 45^\circ, 75^\circ, -15^\circ, -45^\circ, -75^\circ$