Name: ____

Double Angle Formulas

1) If sin x = -3/5 and x is in Quadrant III, find sin 2x; cos 2x, and tan 2x.

2) Use an identity to write each expression as a single trigonometric function value or as a single number

1) $\cos^2 15^0 - \sin^2 15^0$

2) $1 - 2\sin^2 22\frac{1}{2}^0$

3) $1 - 2\sin^2 15^0$

4) $\cos^2 \frac{\pi}{8} - \frac{1}{2}$

5) $2\cos^2 67\frac{1}{2}^0 - 1$

6) $\frac{1}{4} - \frac{1}{2}\sin^2 47.1^0$

7) $\frac{1}{8}\sin 29.5^0 \cos 29.5^0$

8) $\frac{2\tan 15^0}{1 - \tan^2 15^0}$

9) $\frac{\tan 51^0}{1 - \tan^2 51^0}$

10) $\frac{\tan 34^0}{2\left(1 - \tan^2 34^0\right)}$

3) Given $\cos\theta = \frac{3}{5}$ and $\sin\theta < 0$, find $\sin 2\theta$, $\cos 2\theta$, *and* $\tan 2\theta$

4) Find the exact values of sin 2u, cos 2u, and tan 2u using the double-angle formulas.

1) $\sin u = -\frac{4}{5}, \pi < u < \frac{3\pi}{2}$

2) $\cos u = -\frac{2}{\sqrt{5}}, \frac{\pi}{2} < u < \pi$

5) Use double-angle formulas to verify the identity algebraically

1) $\sin 4x = 8\cos^3 x \sin x - 4\cos x \sin x$
2) $\tan^2 x = \dfrac{1-\cos 2x}{1+\cos 2x}$
3) $\cot x \sin 2x = 1 + \cos 2x$

6) Simplify each expression

1) $\cos^2 7x - \sin^2 7x$

2) $\sin 15^0 \cos 15^0$

7) Write sin3x in terms of sinx

8) Express $\sin^4 x$ in terms of the first power of cosine.