Name: _____ M$6 Classwork 6

Formulas

Functions of the Sum of Two Angles

$$\sin(A+B) = \sin A\cos B + \cos A\sin B$$
$$\cos(A+B) = \cos A\cos B - \sin A\sin B$$

Functions of the Difference of Two Angles

$$\sin(A-B) = \sin A\cos B - \cos A\sin B$$
$$\cos(A-B) = \cos A\cos B + \sin A\sin B$$

Functions of the Double Angle

$$\sin 2A = 2\sin A\cos A$$
$$\cos 2A = \cos^2 A - \sin^2 A$$
$$\cos 2A = 2\cos^2 A - 1$$
$$\cos 2A = 1 - 2\sin^2 A$$

Functions of the Half Angle

$$\sin \tfrac{1}{2}A = \pm\sqrt{\frac{1-\cos A}{2}}$$
$$\cos \tfrac{1}{2}A = \pm\sqrt{\frac{1+\cos A}{2}}$$

1. If $\sin x = \frac{4}{5}$ and x is a positive acute angle, find (a) $\sin 2x$ (b) $\cos \frac{1}{2}x$

2. If $\cos y = \frac{1}{2}$ and $\frac{3\pi}{2} < y < 2\pi$, find (a) $\cos 2y$ (b) $\sin \frac{1}{2}y$

3. If $\sin\theta = 0.6$ and θ lies in Quadrant II, find (a) $\cos(2\theta)$ (b) $\cos\left(\frac{\theta}{2}\right)$

4. If $\tan\theta = \frac{1}{3}$ and θ lies in Quadrant III, find (a) $\sin(2\theta)$ (b) $\sin\left(\frac{\theta}{2}\right)$

5. Solve $\cos 2\theta + 1 = \cos\theta$ for all values of θ such that $\frac{\pi}{2} \le \theta \le \frac{3\pi}{2}$.

6. Prove the identity: $\sin 2\theta - \tan\theta \cos 2\theta = \tan\theta$