Name: _____

Sum and Difference Formulas

1) Use identities to write each expression as a function of x or θ

1) $\cos(90^0 - \theta)$
2) $\cos(180^0 - \theta)$
3) $\cos\left(x - \frac{3\pi}{2}\right)$
4) $\cos\left(\frac{\pi}{2} + x\right)$
5) $\sin(45^0 + \theta)$
6) $\cos\left(\frac{\pi}{4} - x\right)$
7) $\tan(60^0 + \theta)$
8) $\tan\left(x + \frac{\pi}{6}\right)$
9) $\tan\left(\frac{\pi}{4} + x\right)$
10) $\sin\left(\frac{5\pi}{6} - x\right)$
11) $\sin\left(\frac{\pi}{3} - x\right)$
12) $\tan(30^0 - \theta)$

2) Verify the identity.

1) $\cos\left(x + \frac{\pi}{2}\right) = -\sin x$
2) $\sin\left(x - \frac{3\pi}{2}\right) = \cos x$
3) $\cot\left(\frac{\pi}{2} - x\right) = \tan x$
4) $\sin(\pi - x) = \sin x$
5) $\cot 3x = 4\cos^3 x - 3\cos x$
6) $\frac{\sin(\alpha + \beta)}{\cos\alpha \cos\beta} = \tan\alpha + \tan\beta$

3) Verify that each equation is an identity

1) $\sin(x + y) + \sin(x - y) = 2\sin x \cos y$
2) $\tan(x - y) - \tan(y - x) = \frac{2(\tan x - \tan y)}{1 + \tan x \tan y}$
3) $\frac{\cos(x - y)}{\cos x \cos y} = \tan x + \cot y$
4) $\frac{\sin(s + t)}{\cos s \cos t} = \tan s + \tan t$
5) $\frac{\sin(s - t)}{\sin(s + t)} = \frac{\tan s - \tan t}{\tan s + \tan t}$
6) $\frac{\sin(s - t)}{\sin t} + \frac{\cos(s - t)}{\cos t} = \frac{\sin s}{\sin t \cos t}$