Section 5.4

Sum and Difference Formulas for Sine and Tangent

Problem 1. Find the exact values of the following functions.

(a) $\sin 15^\circ$

Compare this answer with the result we obtained yesterday: $\sin 15^\circ = \dfrac{\sqrt{2-\sqrt{3}}}{2}$. Are these two answers the same?

(b) $\tan \dfrac{11\pi}{12}$

(c) $\dfrac{\tan 100^\circ - \tan 70^\circ}{1 + \tan 100^\circ \tan 70^\circ}$

Problem 2. Use the sum and difference formulas to write each function as an expression inolving functions of θ only.

(a) $\sin(\theta - 270^\circ)$

(b) $\tan(\theta + 3\pi)$

(c) $\sin(120^\circ + \theta)$

Problem 3. Suppose that $\cos A = {}^{-7}/_{25}$ with angle A in Quadrant II, and $\sin B = {}^{-3}/_{5}$ with angle B in Quadrant IV. Find each of the following:

(a) $\sin(A - B)$

(b) $\tan(A - B)$

(c) The quadrant of $A - B$.

Problem 4. Verify the identity $\tan\left(\frac{\pi}{4}+t\right)+\tan\left(\frac{\pi}{4}-t\right)=\frac{2\sec^2 t}{1-\tan^2 t}$.