10. $\tan(x-y)$ if $\tan x = \frac{5}{4}$ and $\sec y = 2$

$$\frac{\tan x - \tan y}{1+\tan x \tan y}$$

$\tan^2 y + 1 = 2^2$

$\tan^2 y = 3$

$\tan y = \sqrt{3}$

$$\frac{\frac{5}{4} - \sqrt{3}}{1+\left(\frac{5}{4}\right)(\sqrt{3})} = \frac{\frac{5}{4} - \frac{4\sqrt{3}}{4}}{\frac{4}{4} + \frac{5\sqrt{3}}{4}} = \frac{\frac{5-4\sqrt{3}}{4}}{\frac{4+5\sqrt{3}}{4}}$$

$$= \frac{5-4\sqrt{3}}{4} \cdot \frac{4}{4+5\sqrt{3}} = \frac{5-4\sqrt{3}}{4+5\sqrt{3}} \cdot \frac{4-5\sqrt{3}}{4-5\sqrt{3}}$$

$$= \frac{20-25\sqrt{3}-16\sqrt{3}+60}{16-75} = \frac{80-41\sqrt{3}}{-59}$$

$$= \frac{-80+41\sqrt{3}}{59}$$

9. $\cos(x+y)$ if $\sin x = \frac{2}{3}$ and $\sin y = \frac{3}{4}$

$\cos x \cos y - \sin x \sin y$

$= \left(\frac{\sqrt{5}}{3}\right)\left(\frac{\sqrt{7}}{4}\right) - \left(\frac{2}{3}\right)\left(\frac{3}{4}\right)$

$= \frac{\sqrt{35} - 6}{12}$

$\left(\frac{2}{3}\right)^2 + \cos^2 x = 1$

$\cos^2 x = \frac{5}{9}$

$\cos x = \frac{\sqrt{5}}{3}$

$\left(\frac{3}{4}\right)^2 + \cos^2 y = 1$

$\cos^2 y = \frac{7}{16}$

$\cos y = \frac{\sqrt{7}}{4}$

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Quiz Monday

Sections 7.1-7.3

Worksheet due Friday