Sum & Difference of Sine & Cosine
Pop Quiz

/17pts

Name Key 2020

1. Find the exact measure for Tan 15^0.

$\tan(135-120) = \frac{\tan 135 - \tan 120}{1+\tan 135 \tan 120} = \frac{-1+\sqrt{3}}{1+(-1)(-\sqrt{3})} = \frac{(-1+\sqrt{3})(1-\sqrt{3})}{(1+\sqrt{3})(1-\sqrt{3})}$

$\frac{-1+\sqrt{3}+\sqrt{3}-3}{1-3} = \frac{-4+2\sqrt{3}}{-2} = \boxed{2-\sqrt{3}}$

2. Find the exact measure for $\sin\frac{7\pi}{12}$.

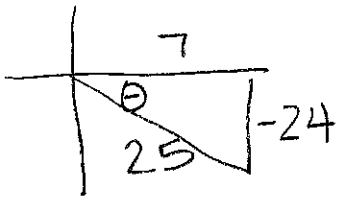
$\sin\left(\frac{3\pi}{4}+\frac{\pi}{3}\right) = \sin\frac{\pi}{4}\cos\frac{\pi}{3} + \cos\frac{\pi}{4}\sin\frac{\pi}{3}$

$\frac{\sqrt{2}}{2}\cdot\frac{1}{2} + \frac{\sqrt{2}}{2}\cdot\frac{\sqrt{3}}{2}$

$\frac{\sqrt{2}}{4} + \frac{\sqrt{6}}{4} = \boxed{\frac{\sqrt{2}+\sqrt{6}}{4}}$ ✓

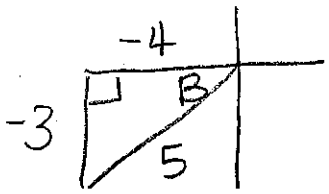
3. Draw and label the given triangles using the following information:

a. θ is in quadrant IV and $\sec\theta = \frac{25}{7}$. h, a



✓

b. B is in quadrant III and $\cot B = \frac{4}{3}$. a, o



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4. Use the triangles above to find the following:
(Show expansion, substitution, math and answer!)

a. $\sin(\beta+\theta)$

$\sin B\cos\theta + \cos B\sin\theta$

$\frac{-3}{5}\cdot\frac{7}{25} + \frac{-4}{5}\cdot\frac{-24}{25}$

$\frac{-21}{125} + \frac{96}{125} = \boxed{\frac{3}{5}}$

b. $\cos\left(\frac{2\pi}{3}-B\right)$

$\cos\frac{2\pi}{3}\cos B + \sin\frac{2\pi}{3}\sin B$

$-\frac{1}{2}\cdot\frac{-4}{5} + \frac{\sqrt{3}}{2}\cdot\frac{-3}{5}$ ✓

$\frac{4}{10} - \frac{3\sqrt{3}}{10} = \boxed{\frac{4-3\sqrt{3}}{10}}$

5. Write the following as a single trig function of a single angle: (Hint ... think of the identities backwards.)

os25°cos32° – sin25°sin32°

$\cos(25+32) = \boxed{\cos 57^\circ}$ ✓