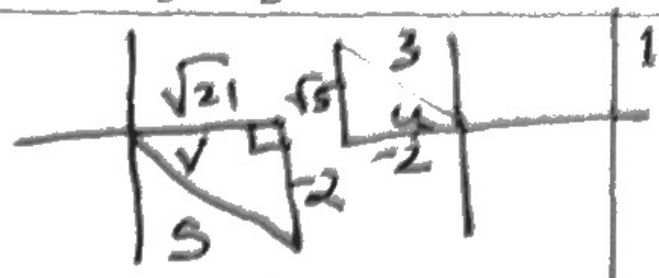
Write the trig identity as its original angle, given the double angle formula.

5. $\sin$ 80° / sin(2·40°) $= 2\sin 40^\circ \cos 40^\circ$	6. cos ____ $= \cos^2 31^\circ - \sin^2 31^\circ$
cos 200 / cos[2(100)] $= 2\cos^2 100^\circ - 1$	8. ____ $= \dfrac{2\tan 15^\circ}{1 - \tan^2 15^\circ}$
9. cos 140° $= 1 - 2\sin^2 70^\circ$	10. ____ $= 2\sin 241^\circ \cos 241^\circ$

Find the exact value. Hint: Sketch a triangle for u and v, then use the sum/diff and double angle trig identities. SOLVE: $\sin v = \dfrac{-2}{5}, \dfrac{3\pi}{2} < v < 2\pi$ and $\cos u = \dfrac{-2}{3}, \dfrac{\pi}{2} < u < \pi$

11. $\sin(u+v)$



$\sin(u+v) = \sin u \cos v + \cos u \sin v$

$= \left(\frac{\sqrt{5}}{3}\right)\left(\frac{\sqrt{21}}{5}\right) + \left(\frac{-2}{3}\right)\left(\frac{-2}{5}\right)$

$= \frac{\sqrt{105}}{15} + \frac{4}{15}$

12. $\cos(v-u)$

$-\frac{2\sqrt{21}}{15} - \frac{2\sqrt{5}}{15}$

13. $\tan(u+v) = \dfrac{\tan u + \tan v}{1 - \tan u \tan v}$

$= \dfrac{\left(-\frac{\sqrt{5}}{2}\right) + \left(\frac{-2}{\sqrt{21}}\right)}{1 - \left(-\frac{\sqrt{5}}{2}\right)\left(\frac{-2}{\sqrt{21}}\right)}$

$= \dfrac{\frac{-\sqrt{105} - 4}{2\sqrt{21}}}{\frac{\sqrt{21} - \sqrt{5}}{\sqrt{21}}} = \frac{-\sqrt{105} - 4}{2\sqrt{21}} \cdot \frac{\sqrt{21}}{\sqrt{21} - \sqrt{5}}$

14. $\cos(2u)$

$-\frac{1}{9}$

15. $\sin(2v)$

$\sin(2v) = 2\sin v \cos v$

$= 2\left(\frac{-2}{5}\right)\left(\frac{\sqrt{21}}{5}\right)$

$= \frac{-4\sqrt{21}}{25}$

16. $\tan(2u)$

$\frac{25}{3}$