

#30 $(\sin \frac{\pi}{3} \cos \frac{\pi}{4} - \sin \frac{\pi}{4} \cos \frac{\pi}{3})^2$

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

$\frac{\sqrt{6}}{4} - \frac{\sqrt{2}}{4} = \left(\frac{\sqrt{6}-\sqrt{2}}{4}\right)^2 = \frac{(\sqrt{6}-\sqrt{2})(\sqrt{6}-\sqrt{2})}{16}$

$= \frac{6-2\sqrt{12}+2}{16}$

$\frac{4-2\sqrt{3}}{8} = \frac{4-\sqrt{12}}{8} = \frac{8-2\sqrt{12}}{16}$

$\frac{2-\sqrt{3}}{4}$

4b)

$\sin \theta = \frac{a}{c}$ $\sin \theta = \frac{a}{b}$

$\tan \theta = \frac{b}{c}$ $c = \frac{1}{\cos \theta}$

$\cos \theta = \frac{d}{c}$ $\cos \theta = d$

$\cos \theta = \frac{d}{1}$

49)

$\tan(0.5^\circ) = \frac{x}{240,000}$

a) $240,000 \tan(0.5^\circ) = x = 2094.44 \text{ mi}$

b) No

60)

$\tan 75^\circ = \frac{h}{600 - 473.2}$

$h = 473.2 \text{ m}$

$\tan 45^\circ = \frac{h}{x}$ $\tan 75^\circ = \frac{h}{600 - x}$

$x \tan 45^\circ = h = (600 - x) \tan 75^\circ$

$x \tan 45^\circ = 600 \tan 75^\circ - x \tan 75^\circ$

$x \tan 45^\circ + x \tan 75^\circ = 600 \tan 75^\circ$

$x (\tan 45^\circ + \tan 75^\circ) = \frac{600 \tan 75^\circ}{\tan 45^\circ + \tan 75^\circ}$

$x = 473.21 \text{ m}$