

$$1. \cos(u+v)$$

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

$$2. \tan(u-v)$$

$$= \frac{\tan(u) - \tan(v)}{1 + \tan(u)\tan(v)}$$

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

$$= \cos \frac{\pi}{4} \cos \frac{\pi}{3} - \sin \frac{\pi}{4} \sin \frac{\pi}{3}$$

$$= \frac{1}{\sqrt{2}} \left(\frac{1}{2} \right) - \frac{1}{\sqrt{2}} \left(\frac{\sqrt{3}}{2} \right)$$

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

$$= \frac{\sqrt{2} - \sqrt{6}}{4}$$

$$(b) \cos \frac{\pi}{4} + \cos \frac{\pi}{3}$$

$$= \frac{1}{\sqrt{2}} + \frac{1}{2} = \frac{\sqrt{2} + 1}{2}$$

4.

$$a) \sin(135^\circ - 60^\circ)$$

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

$$b) \sin 135^\circ - \cos 60^\circ$$

$$= \frac{\sqrt{2}}{2} - \frac{1}{2}$$

$$= \frac{\sqrt{2} - 1}{2}$$