

HW9 MATH 1540 FALL 2018

$$\frac{\pi}{4} - \frac{\pi}{6} = \frac{3\pi}{12} - \frac{2\pi}{12} = \frac{\pi}{12}$$

guess + check to find

§9.2 : #5

$$\cos\left(\frac{\pi}{12}\right) \stackrel{\text{half angle}}{=} \cos\left(\frac{\frac{\pi}{6}}{2}\right)$$

$\uparrow \qquad \qquad \uparrow$
 $\alpha \qquad \qquad \beta$

difference identity = $\cos\left(\frac{\pi}{4}\right)\cos\left(\frac{\pi}{6}\right) + \sin\left(\frac{\pi}{4}\right)\sin\left(\frac{\pi}{6}\right)$

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

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

#13 $\sin\left(\frac{\pi}{8}\right) = \sin\left(\frac{\pi/4}{2}\right)$

half angle = $\sqrt{\frac{1 - \cos(\pi/4)}{2}} = \sqrt{\frac{1 - \sqrt{2}/2}{2}}$