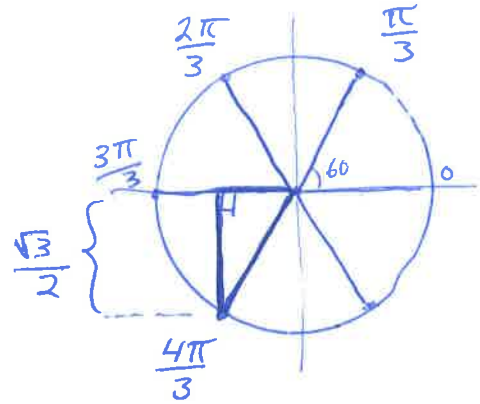
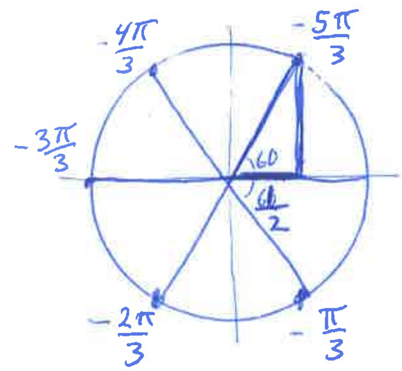
Hammack 3.1

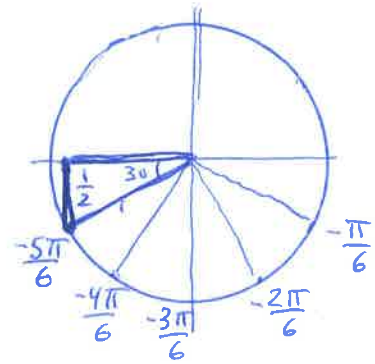
(2) $\sin\left(\frac{4\pi}{3}\right) = \boxed{-\frac{\sqrt{3}}{2}}$



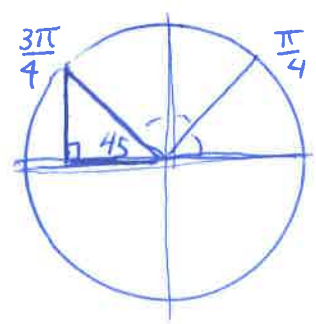
(8) $\cos\left(-\frac{5\pi}{3}\right) = \boxed{\frac{1}{2}}$



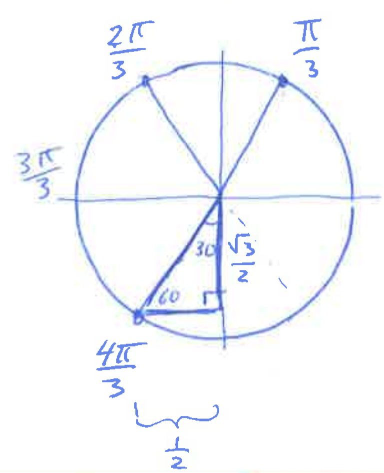
(14) $\csc\left(-\frac{5\pi}{6}\right) = \frac{1}{\sin\left(-\frac{5\pi}{6}\right)} = \frac{1}{-\frac{1}{2}} = \boxed{-2}$



(20) $\csc\left(\frac{3\pi}{4}\right) = \frac{1}{\sin\left(\frac{3\pi}{4}\right)} = \frac{1}{\frac{\sqrt{2}}{2}} = \frac{2}{\sqrt{2}} = \boxed{\sqrt{2}}$

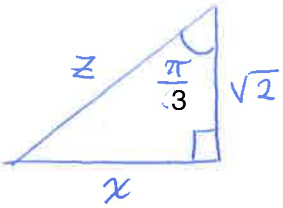


(22) $\tan\left(\frac{4\pi}{3}\right) = \frac{\sin\left(\frac{4\pi}{3}\right)}{\cos\left(\frac{4\pi}{3}\right)} = \frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \boxed{\sqrt{3}}$



Hammack 3.2

(7)



To find x:

$\tan\left(\frac{\pi}{3}\right) = \frac{OPP}{ADJ} = \frac{x}{\sqrt{2}}$

Therefore $x = \sqrt{2}\tan\left(\frac{\pi}{3}\right) = \sqrt{2}\sqrt{3} = \boxed{\sqrt{6}}$

$\boxed{x = \sqrt{6}}$

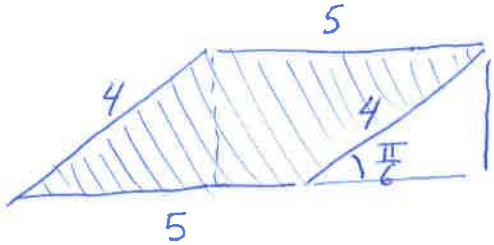
To find z

$\sec\left(\frac{\pi}{3}\right) = \frac{HYP}{ADJ} = \frac{z}{\sqrt{2}}$

Therefore $z = \sqrt{2}\sec\left(\frac{\pi}{3}\right) = \frac{\sqrt{2}}{\cos(\pi/3)}$

$= \frac{\sqrt{2}}{1/2} = \boxed{2\sqrt{2}}$ $\boxed{z = 2\sqrt{2}}$

(12)



$h = 4\sin\left(\frac{\pi}{6}\right) = 4 \cdot \frac{1}{2} = 2$

Note that the height h is $h = 2$ (above)

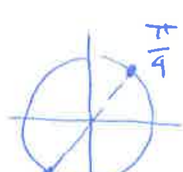
Area = (base)(height) $= 5 \cdot 2 = \boxed{10 \text{ square units}}$

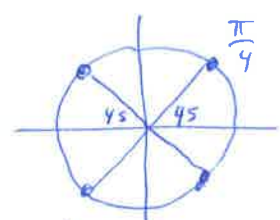
Hammack 3.4

(2) Solve $1 - \tan^2(x) = 0$

$\left(1 + \tan(x)\right)\left(1 - \tan(x)\right) = 0$

$\tan(x) = -1$ $\tan(x) = 1$





Whenever x is one of these angles, then $1 - \tan^2(x) = 0$

Solution

$x = \frac{\pi}{4} + k\frac{\pi}{2}$

where $k = 0, \pm 1, \pm 2, \ldots$