

122 \$1, 2 \#s\$ 2-5 all, 7-49 odds

(2)  $f$  is periodic, if  $\exists c > 0 \ni f(t+c) = f(t)$   
 $\forall t \in \mathcal{D}(f)$ .

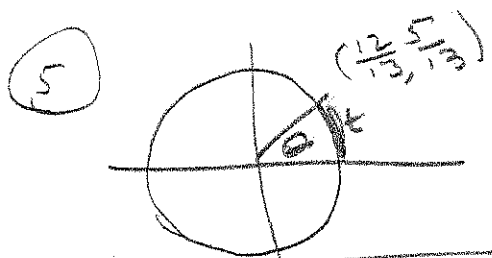
(3) The smallest  $c$  that works for #2 is the period.

(4)  $f(-t) = -f(t) \Rightarrow f$  is odd and  
 $f(-t) = f(t) \Rightarrow f$  is even.

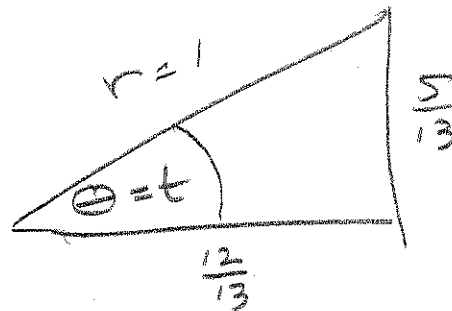
#s 5-8 Determine the EXACT values of  
the six trig functions of the real #  $t$ .

FACT: Arc Length = Angle when you're  
on the unit circle:

$$\theta = \frac{s}{r} = \frac{s}{1} = s \quad \text{! cool.}$$



HERE'S  
MY TABLE:



$$\sin t = \frac{5}{13}$$

$$\csc t = \frac{13}{5}$$

$$\cos t = \frac{12}{13}$$

$$\sec t = \frac{13}{12}$$

$$\tan t = \frac{5}{12}$$

$$\cot t = \frac{12}{5}$$

$$\sin \theta = -\frac{3}{5}$$

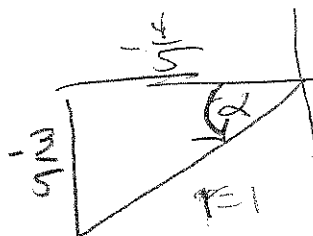
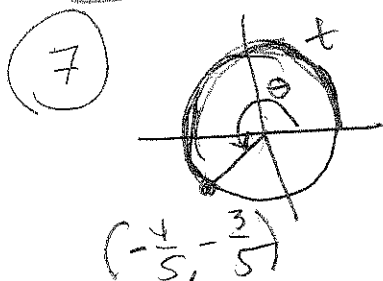
$$\csc \theta = -\frac{5}{3}$$

$$\cos \theta = -\frac{4}{5}$$

$$\sec \theta = -\frac{5}{4}$$

$$\tan \theta = \frac{3}{4}$$

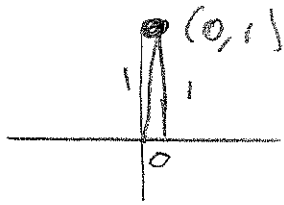
$$\cot \theta = \frac{4}{3}$$



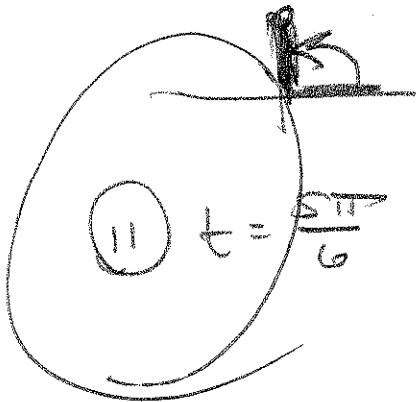
122 §1,2 #5 9-49

#5 9-12 Find the point on the unit circle corresponding to  $t$ . ( $r=1$  ✓)

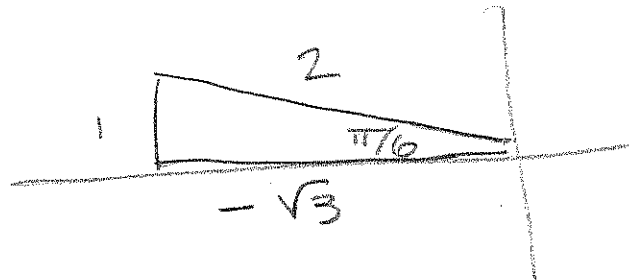
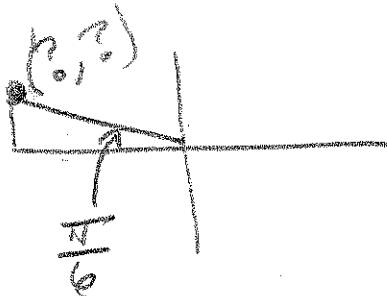
9  $t = \frac{\pi}{2}$



$(0, 1)$



11  $t = \frac{5\pi}{6}$



$(x, y) = (r \cos \theta, r \sin \theta) = (1 \cdot -\frac{\sqrt{3}}{2}, 1 \cdot \frac{1}{2})$

$(-\frac{\sqrt{3}}{2}, \frac{1}{2})$

Class is parsimonious with paper. Not good for learning.

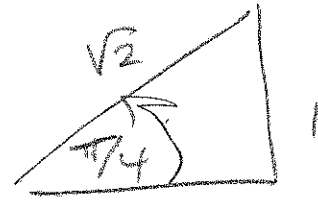
#5 13-22 Evaluate sine, cosine, tangent:

13  $t = \frac{\pi}{4}$

$\sin \frac{\pi}{4} = \frac{1}{\sqrt{2}}$

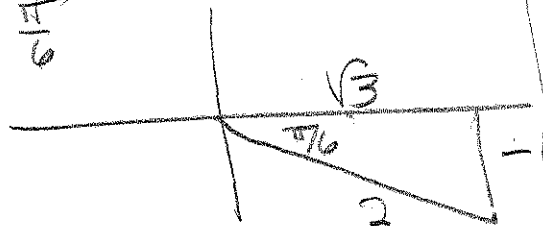
$\cos \frac{\pi}{4} = \frac{1}{\sqrt{2}}$

$\tan \frac{\pi}{4} = 1$



#21

15  $t = -\frac{\pi}{6}$



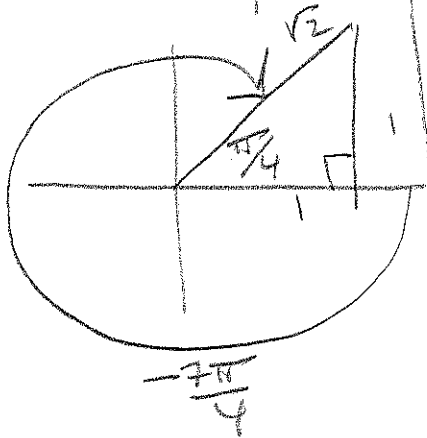
$\sin -\frac{\pi}{6} = -\frac{1}{2}$

$\cos(-\frac{\pi}{6}) = \frac{\sqrt{3}}{2}$

$\tan(-\frac{\pi}{6}) = -\frac{1}{\sqrt{3}}$

122 § 1,2 #5 17-49

(17)  $t = -\frac{7\pi}{4}$

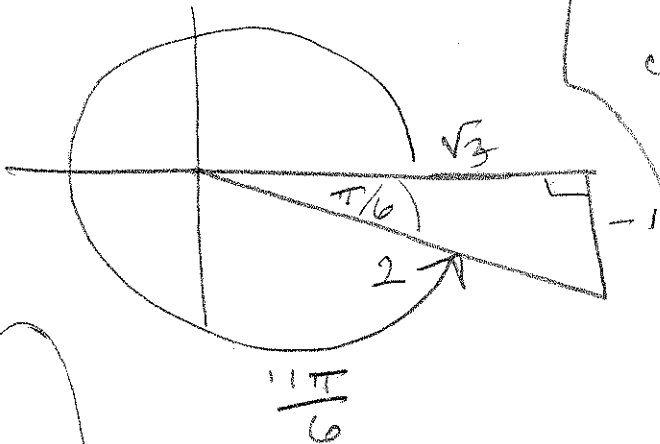


$$\sin\left(-\frac{7\pi}{4}\right) = \frac{1}{\sqrt{2}}$$

$$\cos\left(-\frac{7\pi}{4}\right) = \frac{1}{\sqrt{2}}$$

$$\tan\left(-\frac{7\pi}{4}\right) = 1$$

(19)  $t = \frac{11\pi}{6}$



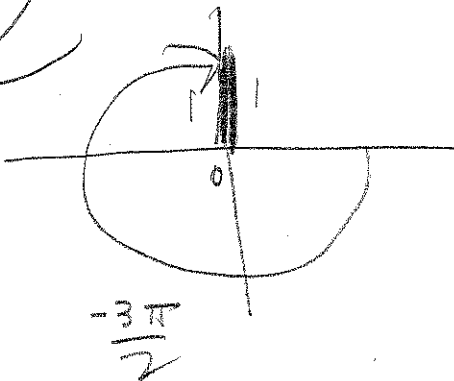
$$\sin\left(\frac{11\pi}{6}\right) = -\frac{1}{2}$$

$$\cos\left(\frac{11\pi}{6}\right) = \frac{\sqrt{3}}{2}$$

$$\tan\left(\frac{11\pi}{6}\right) = -\frac{1}{\sqrt{3}}$$

(21)

$t = -\frac{3\pi}{2}$



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

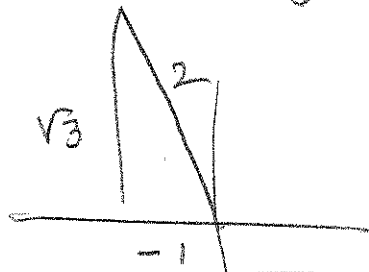
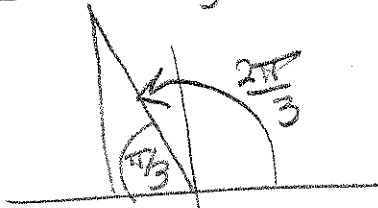
$$\cos\left(-\frac{3\pi}{2}\right) = 0$$

$$\tan\left(-\frac{3\pi}{2}\right) \text{ is not defined}$$

#25

~~(23)  $t = \frac{2\pi}{3}$~~ 

#s 23-30 Evaluate all 6 trig functions

(23)  $t = \frac{2\pi}{3}$ 

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

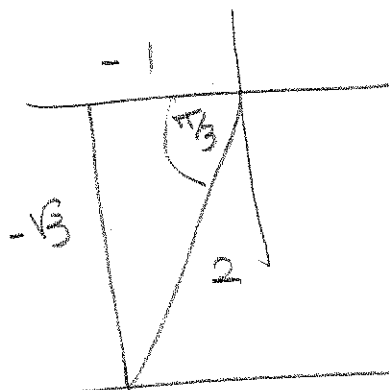
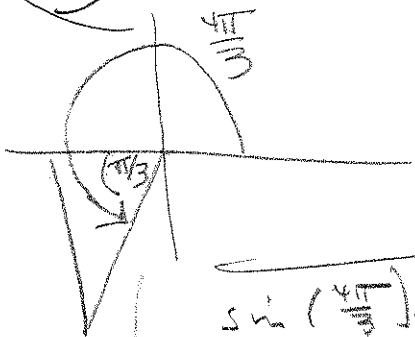
$$\csc\left(\frac{2\pi}{3}\right) = \frac{2}{\sqrt{3}}$$

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

$$\sec\left(\frac{2\pi}{3}\right) = -2$$

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

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

(25)  $t = \frac{4\pi}{3}$ 

#35

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

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

$$\cos\left(\frac{4\pi}{3}\right) = -\frac{1}{2}$$

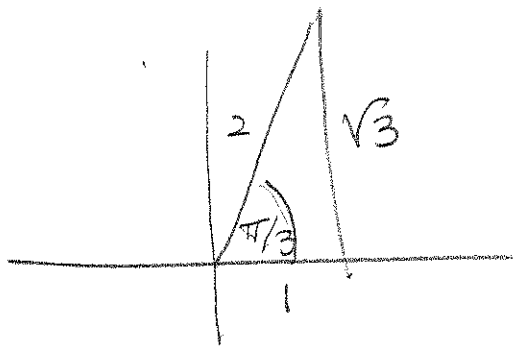
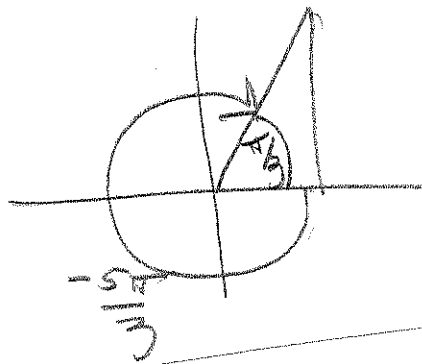
$$\sec\left(\frac{4\pi}{3}\right) = -2$$

$$\tan\left(\frac{4\pi}{3}\right) = \sqrt{3}$$

$$\cot\left(\frac{4\pi}{3}\right) = \frac{1}{\sqrt{3}}$$

122 § 1.2 #s 27-49

(27)  $t = -\frac{5\pi}{3}$



$$\sin\left(-\frac{5\pi}{3}\right) = \frac{\sqrt{3}}{2}$$

$$\csc\left(-\frac{5\pi}{3}\right) = \frac{2}{\sqrt{3}}$$

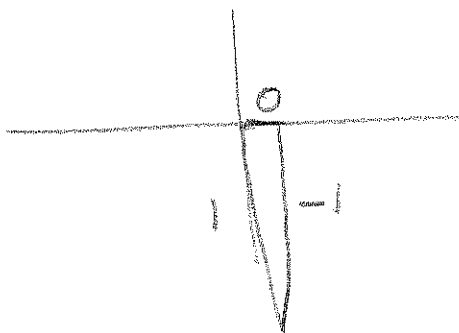
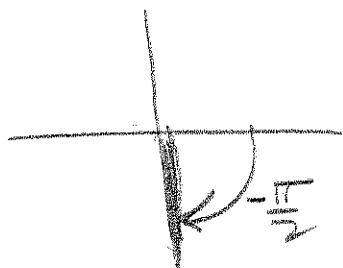
$$\cos\left(-\frac{5\pi}{3}\right) = \frac{1}{2}$$

$$\sec\left(-\frac{5\pi}{3}\right) = 2$$

$$\tan\left(-\frac{5\pi}{3}\right) = \sqrt{3}$$

$$\cot\left(-\frac{5\pi}{3}\right) = \frac{1}{\sqrt{3}}$$

(29)  $t = -\frac{\pi}{2}$



$$\sin\left(-\frac{\pi}{2}\right) = -1$$

$$\csc\left(-\frac{\pi}{2}\right) = -1$$

$$\cos\left(-\frac{\pi}{2}\right) = 0$$

$$\sec\left(-\frac{\pi}{2}\right) \text{ is undefined}$$

$$\tan\left(-\frac{\pi}{2}\right) \text{ is undefined}$$

$$\cot\left(-\frac{\pi}{2}\right) = 0$$

122 § 1.2 # 31-49

# 31-36 Evaluate using period as an aid.

(31)  $\sin(4\pi) = \sin(2 \cdot 2\pi) = \sin(2\pi) = \sin(0) = 0$

(33)  $\cos\left(\frac{7\pi}{3}\right) = \cos\left(\frac{6\pi}{3} + \frac{1\pi}{3}\right) = \cos\left(2\pi + \frac{\pi}{3}\right)$

$= \cos\left(\frac{\pi}{3}\right) = \frac{1}{2}$



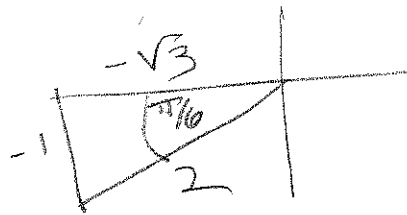
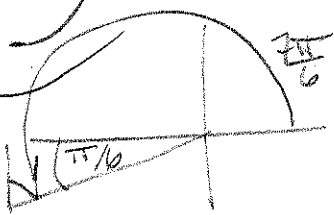
ALTERNATE:

$\frac{7\pi}{3} = \left(2 + \frac{1}{3}\right)\pi$

$= 2\pi + \frac{\pi}{3}$

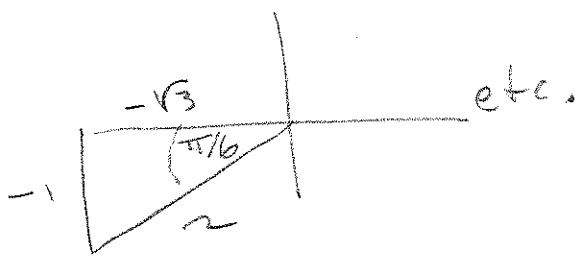
(35)  $\sin\left(\frac{19\pi}{6}\right) = \sin\left(\frac{12\pi}{6} + \frac{7\pi}{6}\right) = \sin\left(2\pi + \frac{7\pi}{6}\right) = \sin\left(\frac{7\pi}{6}\right)$

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



Alternate:  $\frac{19\pi}{6} = \left(3 + \frac{1}{6}\right)\pi = \frac{3\pi}{1} + \frac{\pi}{6}$

# 43



# 37-42 Use one trig value to find another.

(37)  $\sin(t) = \frac{1}{2}$

(a)  $\sin(-t) = -\frac{1}{2}$

(b)  $\csc(-t) = -2$

(39)  $\cos(-t) = -\frac{1}{5}$

(a)  $\cos(t) = -\frac{1}{5}$

(b)  $\sec(-t) = -5$

122 § 1.2 #s 41-49

(41)  $\sin(t) = \frac{4}{5}$

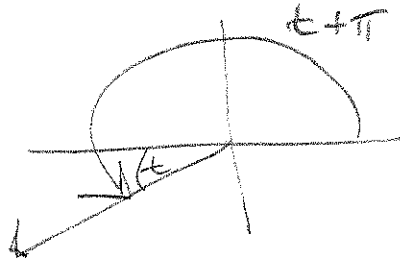
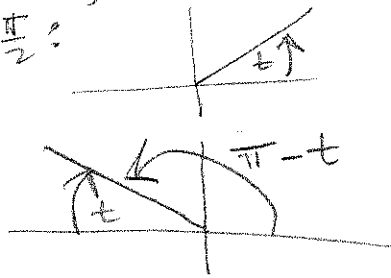
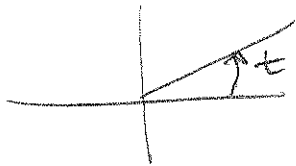
(a)  $\sin(\pi - t) = \frac{4}{5}$

(b)  $\sin(t + \pi) = -\frac{4}{5}$

Adding  $\pi$  to  $t$   
Reflects thru origin

Adding  $\pi - t$ :  
basically reflects about the y-axis.

$0 < t < \frac{\pi}{2}$ :



#s 43-48 Calculator trig Round to 4 places

(43)  $\tan\left(\frac{\pi}{3}\right) \approx 1.7321$

(45)  $\csc(0.8) \approx 1.3940$

(47)  $\sec(1.8) \approx -4.4014$

(49) Displacement from rest of a weight hanging from a spring is given by:

$y(t) = \frac{1}{4} \cos(6t)$ , where

$y$  = displacement, in feet, and  $t$  = time, in seconds

(a)  $y(0) = \frac{1}{4} \cos(6 \cdot 0) = \frac{1}{4}$  ft

(b)  $y\left(\frac{1}{4}\right) = \frac{1}{4} \cos\left(\frac{6}{4}\right) \approx 0.0176843004$  ft

(c)  $y\left(\frac{1}{2}\right) = \frac{1}{4} \cos\left(\frac{6}{2}\right) \approx -0.2474981242$  ft