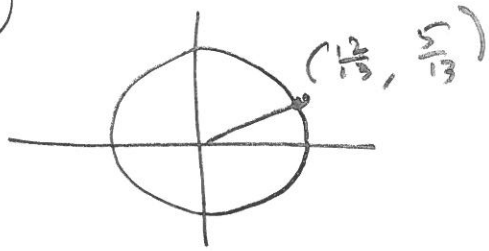
122 §1.2

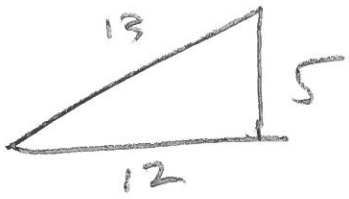
(1) unit circle
(2) periodic
(3) period, T
(4) ① odd: $f(-t) = -f(t)$
(5) even: $f(-t) = f(t)$

4 pts

#5,6 Find the 6 trigs corresponding to t.
(t = arc length = angle θ when radius = 1.)

(5)





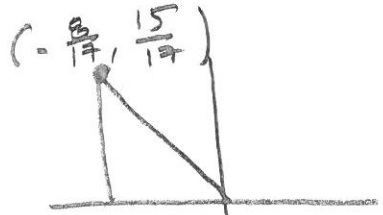
$\sin t = \frac{5}{13}$ $\quad \csc t = \frac{13}{5}$

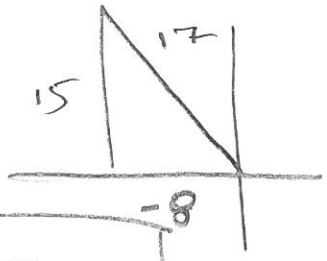
$\cos t = \frac{12}{13}$ $\quad \sec t = \frac{13}{12}$

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

3 pts

(6)





$\sin t = \frac{15}{17}$ $\quad \csc t = \frac{17}{15}$

$\cos t = -\frac{8}{17}$ $\quad \sec t = -\frac{17}{8}$

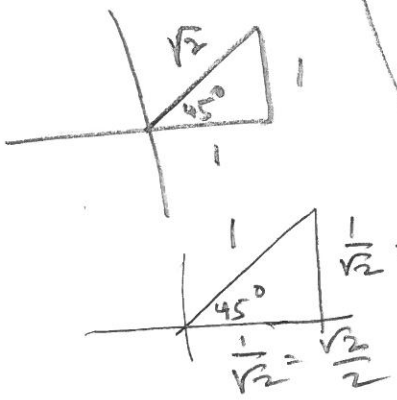
$\tan t = -\frac{15}{8}$ $\quad \cot t = -\frac{8}{15}$

3 pts

12.2 S1.3

#s 9-12 Find (x, y) on the unit circle that corresponds to t.

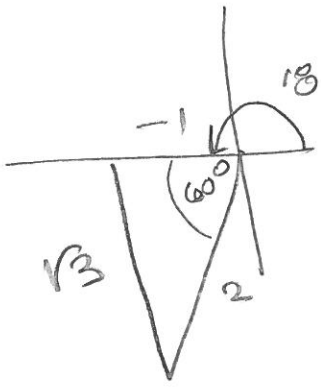
(10) $t = \frac{\pi}{4} \rightsquigarrow 45°$



$(\cos t, \sin t) = \left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$ or $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$

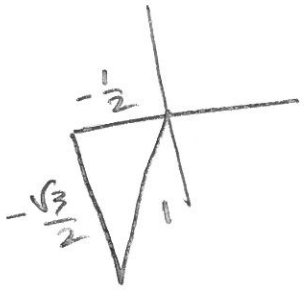
2pts

(12) $t = \frac{4\pi}{3} \rightsquigarrow 240° = 180° + 60°$



$(\cos t, \sin t) = \left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$

1pt



#s 13-22 Evaluate, if possible, the sine, cosine, and tangent of t.

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

$= -45°$

3pts

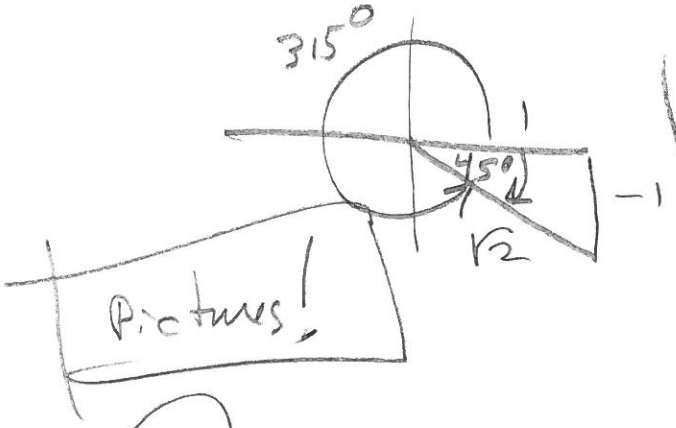
$\sin t = -\frac{1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$

$\cos t = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$\tan t = -1$

#s 23-30 Find 6 trig's, if possible.

(26) $t = \frac{7\pi}{4} \rightarrow 315^\circ$



Pictures!

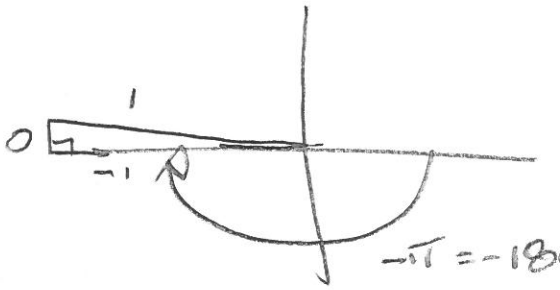
$\sin t = -\frac{1}{\sqrt{2}}$ $\quad \csc t = -\sqrt{2}$

$\cos t = \frac{1}{\sqrt{2}}$ $\quad \sec t = \sqrt{2}$

$\tan t = -1$ $\quad \cot t = -1$

3pts

(30) $t = -\pi$



$\sin t = 0$ $\quad \csc t \not\exists$

$\cos t = -1$ $\quad \sec t = -1$

$\tan t = 0$ $\quad \cot t \not\exists$

3pts

#s 31-36, Use period as an aid to evaluate:

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

$T = 2\pi$

1 pt

(32) $\cos(3\pi) = \cos(\pi + 2\pi) = \cos(\pi) = -1$

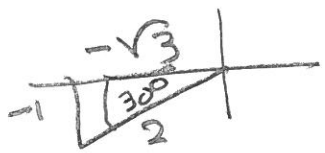
1 pt

cos

(35) $\sin\frac{19\pi}{6} = \sin\left(\frac{12\pi}{6} + \frac{7\pi}{6}\right) = \sin\left(\frac{7\pi}{6}\right) = \sin(210^\circ)$

$\sin\left(\frac{19\pi}{6}\right) = -\frac{1}{2}$

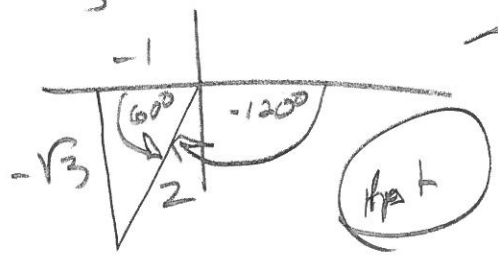
1 pt



122

(36) $\sin\left(-\frac{8\pi}{3}\right) = \sin\left(-\frac{2\pi}{3}\right) = \sin(-120°)$

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



$\sin\left(-\frac{8\pi}{3}\right) = -\frac{\sqrt{3}}{2}$

#s37-42 Use given trig value to find the others?

(39) $\sin(-t) = \frac{3}{8} = -\sin(t) \Rightarrow$ 1pt

ODD
sine

(a) $\sin t = -\frac{3}{8}$, (b) $\csc t = -\frac{8}{3}$

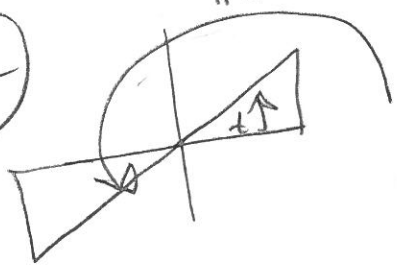
(39) $\cos(-t) = -1 = \cos t$ 1pt

EVEN
cosine

$\pi - t$

(42) $\cos(t) = \frac{4}{5}$

$\pi + t$



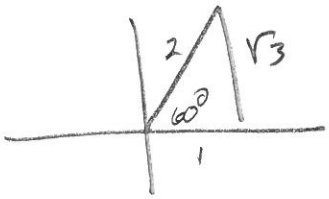
(a) $\cos(\pi - t) = -\frac{4}{5}$

(b) $\cos(t + \pi) = -\frac{4}{5}$ 1pt

122 §1.3 #s

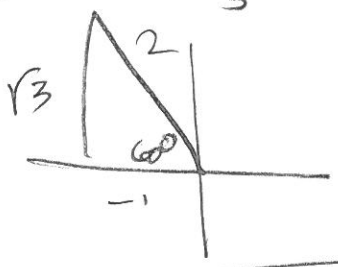
#s 43-48 calculate to 4 decimal places.

(43) $\tan\frac{\pi}{3} = \sqrt{3} \approx 1.7321 \approx \tan\frac{\pi}{3}$



1 pt

(44) $\csc\frac{2\pi}{3} = \csc 120° = \frac{1}{\sin(120°)} = \frac{2}{\sqrt{3}} \approx 1.1547 \approx \csc\frac{2\pi}{3}$



1 pt

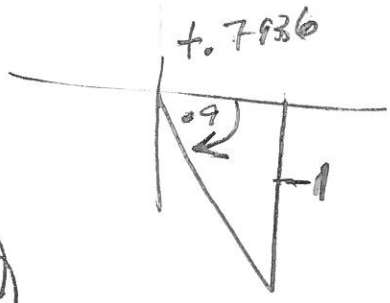
(47) $\sec(1.8) \approx -4.4014$

$1.8 \approx 103.13\ 24031°$

1 pt

(48) $\cot(-.9) \approx -.7936$

$-1.9 \approx -51.56620156°$



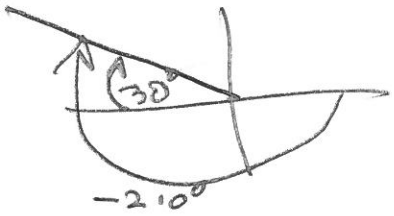
1 pt

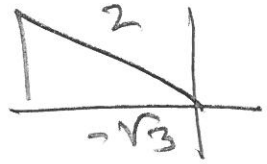
122 §1.2

#s 51-4 True/False & Justify

(51) Because $\sin(-t) = -\sin t$, the sine of a negative angle is a negative #.

FALSE $\sin\left(-\frac{4\pi}{3}\right) = \sin(-210^\circ) = \frac{1}{2} > 0$





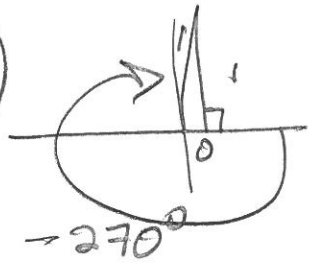
Ip+

(54) $\cos\left(-\frac{7\pi}{2}\right) = \cos\left(-\frac{6\pi}{2} - \frac{\pi}{2}\right) = \cos\left(-3\pi - \frac{\pi}{2}\right)$

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

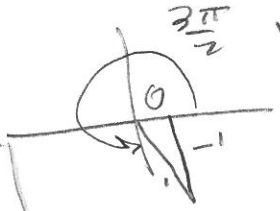
$= \cos\left(-\frac{3\pi}{2}\right) = \cos(-270^\circ) = 0$

No Points



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

Even: $= \cos\left(-\frac{3\pi}{2}\right) = \cos\left(-\frac{7\pi}{2}\right)$



TRUE

Claim:

$\cos\left(-\frac{7\pi}{2}\right) = \cos\left(\pi + \frac{\pi}{2}\right)$ is TRUE

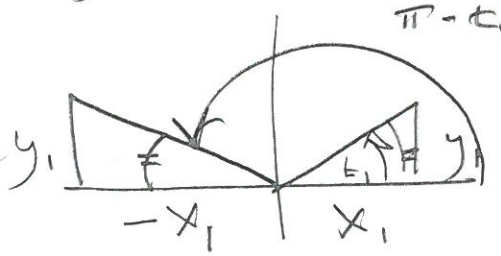
122 §1.2

5-5 $(x_1, y_1) \longleftrightarrow t_1$

$(x_2, y_2) \longleftrightarrow \pi - t_1$

(a) (x_1, y_1) & (x_2, y_2) are reflections about the y-axis of each other. 1pt

(b) By (2), one expects $\sin(t_1) = \sin(\pi - t_1)$



Same reference angle. 1pt

$y_2 = y_1$

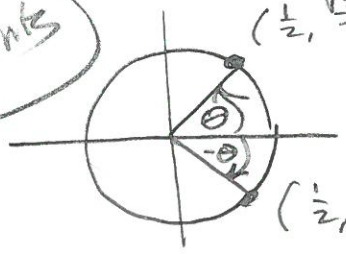
$(x_2, y_2) = (-x_1, y_1)$

(c) $\cos(t_1) = -\cos(\pi - t_1)$ is conjecture for cosine

$x_2 = -x_1$ 1pt

5-6 cosine is even

No points



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

$\sec\theta = \frac{1}{\cos\theta}$ ⟹

$\sec(-\theta) = \sec\theta$, too.

5-7 $\cos(1.5) \approx .070737 \neq 1.463377738$ 1pt

$\cos(2\theta) \neq 2\cos\theta$!