Discuss 2-part Summative

Entertainment

IS YOUR CALCULATOR IN RADIAN MODE?
#1 to 4, 5b, 6, 8, 11d, 12, 13, 14, 16&, 19*
&: for 16, a *d*-value of about 0.3 is acceptable

* for 19d, sub in $h = \pm 0.01$ immediately

Note final answer corrections:

$$\tan\theta = \pm\frac{12}{5}$$

#6 a)

#6 c) $\theta = 2.0 \text{ or } 4.3$

#19d) approx. -144

IS YOUR CALCULATOR IN RADIAN MODE?
Page 378 Self-Test.
Note: do not use a calculator for #2.
In #6 answers may vary.
For #8a, use only a cosine function.
Note final answer corrections:
#1: y = tan x is also a function that is possible!
#3: y = 94.9

p. 376 **6.** If $\cos\theta = \frac{-5}{13}$ and $0 \le \theta \le 2\pi$, determine

a) $\tan\theta$

b) $\sec\theta$

c) the possible values of θ to the nearest tenth

a) $c \times r$

$\cos\theta = \frac{-5}{13}$

$\therefore x = -5 \quad r = 13$

$\therefore x^2 + y^2 = r^2$

$\therefore y = (13)^2 - (-5)^2$

$= 169 - 25$

$= 144$

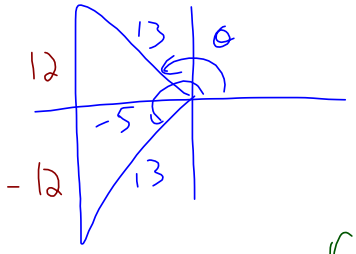
$y = \pm 12$

$\tan\theta = \frac{y}{x}$

$\therefore \tan\theta = \frac{12}{-5}$

or $\tan\theta = \frac{-12}{-5}$

$= \frac{12}{5}$



b) $\sec\theta = \frac{r}{x}$

$= \frac{13}{-5}$

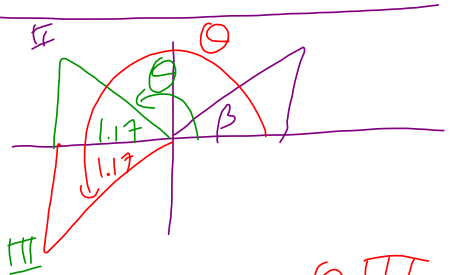
c) $\cos\theta = \frac{-5}{13}$

$\cos\beta = \frac{5}{13}$

$\beta = \cos^{-1}\left(\frac{5}{13}\right)$

$\doteq 1.176$

$\doteq 1.17$



QII

$\theta = \pi - \beta$

$\doteq 1.96$

$\doteq 2.0$

QIII

$\theta = \pi + \beta$

$\doteq 4.31$

$\doteq 4.3$

p. 377 **12.** The current, I, in amperes, of an electric circuit is given by the function $I(t) = 4.5 \sin(120\pi t)$, where t is the time in seconds.

a) Draw a graph that shows one cycle.

b) What is the singular period?

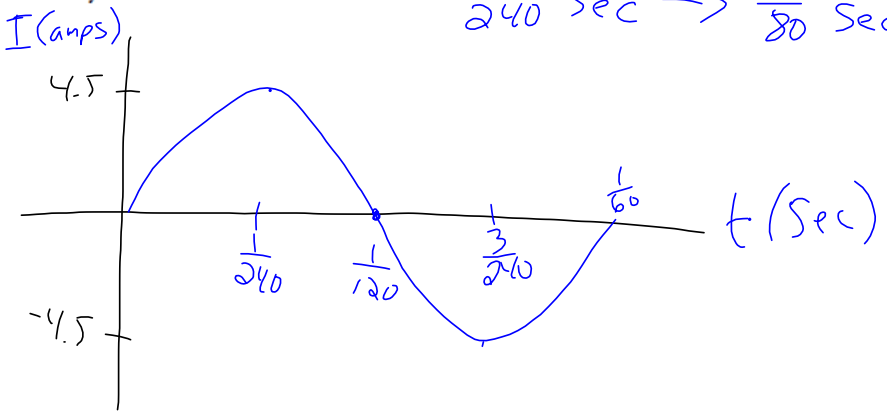
c) At what value of t is the current a maximum in the first cycle?

d) When is the current a minimum in the first cycle?

period $= \frac{2\pi}{120\pi} = \frac{1}{60}$

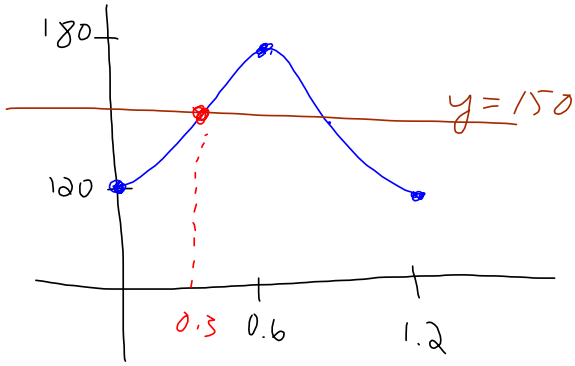
$\frac{1}{240}$ sec

$\rightarrow \frac{3}{240}$ sec $\rightarrow \frac{1}{80}$ sec



p. 377 **16.** A weight is bobbing up and down on a spring attached to a ceiling. The data in the following table give the height of the weight above the floor as it bobs. Determine the sine function that models this situation.

t (s)	0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2
$h(t)$ (cm)	120	136	165	180	166	133	120	135	164	179	165	133



$a = \frac{\text{max} - \text{min}}{2} = \frac{180 - 120}{2} = 30$

$c = \frac{\text{max} + \text{min}}{2} = \frac{180 + 120}{2} = 150$

$k = \frac{2\pi}{\text{period}} = \frac{2\pi}{1.2} = \frac{20\pi}{12} = \frac{5\pi}{3}$

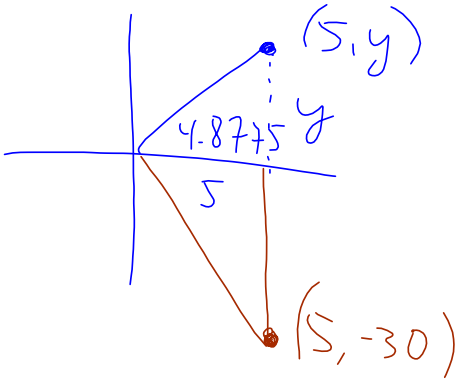
$h(t) = 30\sin\left(\frac{5\pi}{3}(t - 0.3)\right) + 150$

$h(t) = 30\sin\left(\frac{5\pi}{3}t - \frac{\pi}{2}\right) + 150$

$= 30\sin\left(\frac{5\pi}{3}\left(t - \frac{3}{10}\right)\right) + 150$

$\frac{\pi}{2} \div \frac{5\pi}{3} = \frac{\pi}{2} \times \frac{3}{5\pi} = \frac{3}{10} = 0.3$

p. 378 **7.** The point $(5, y)$ lies on the terminal arm of an angle in standard position. If the angle measures 4.8775 radians, what is the value of y to the nearest unit?



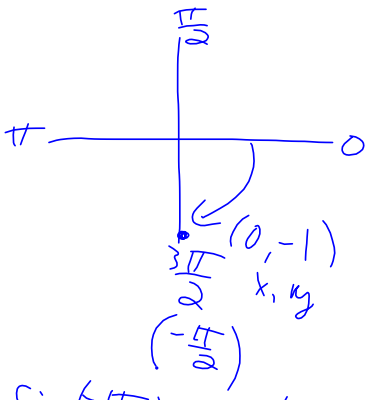
$\tan 4.8775 = \frac{y}{5}$

$y = 5 \tan 4.8775$

$\doteq -30.00$

p. 330 #3 SYR CXR TYX

a) $-\frac{\pi}{2}$



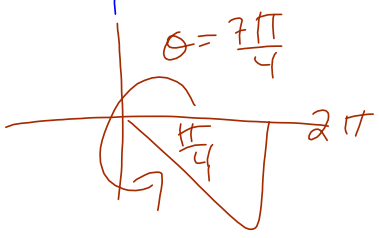
$\sin\left(\frac{\pi}{2}\right) = \frac{-1}{1} = -1$

$\cos\left(\frac{\pi}{2}\right) = \frac{0}{1} = 0$

$\tan\left(-\frac{\pi}{2}\right) = \frac{-1}{0}$

= undefined

c) $\frac{7\pi}{4}$



C

$\sin\frac{7\pi}{4}$ | $\cos\frac{7\pi}{4}$

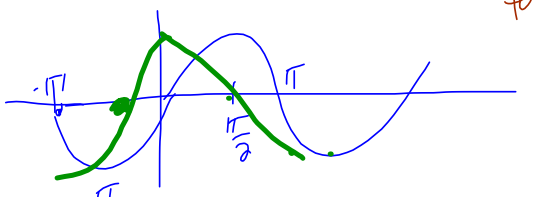
$= -\sin\left(\frac{\pi}{4}\right)$ | $= +\cos\left(\frac{\pi}{4}\right)$

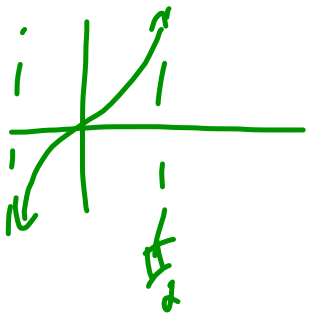
$= -\frac{\sqrt{2}}{2}$ | $= \frac{\sqrt{2}}{2}$

$\tan\frac{7\pi}{4}$

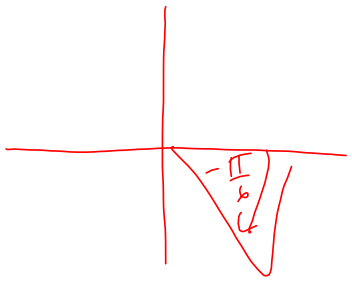
$= -\tan\left(\frac{\pi}{4}\right)$

$= -1$





d) $-\frac{\pi}{6}$



$\sin\left(-\frac{\pi}{6}\right)$ $\cos\left(-\frac{\pi}{6}\right)$ $\tan\left(-\frac{\pi}{6}\right)$

$= -\sin\left(\frac{\pi}{6}\right)$ $= +\cos\frac{\pi}{6}$ $= -\tan\left(\frac{\pi}{6}\right)$

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