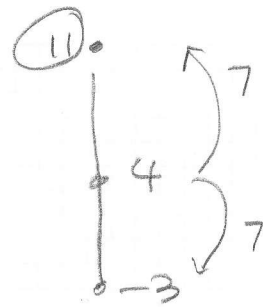
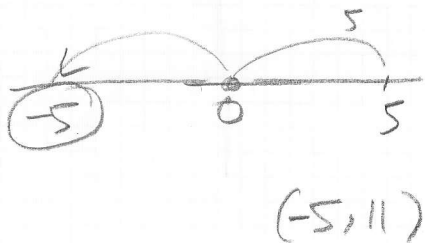


Ch 4, 7-8 Review

① local min $(5, -3)$

Point of symmetry $0, 4$

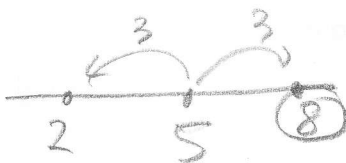


② $f(x) = -x^3 + 15x^2 - 48x + 45$

Point of symmetry: $x = \frac{-b}{3a} = \frac{-15}{3(-1)} = 5$

5	-1	15	-48	45
		-5	50	10
	-1	10	2	55

$(5, 55) = P.O.S$

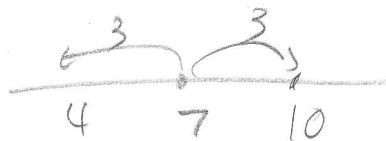
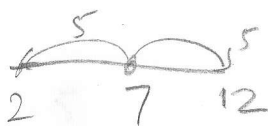


local min $(2, 1)$

$(8, 109)$

③ $(2, 13)$

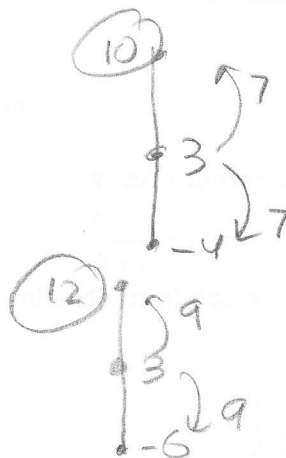
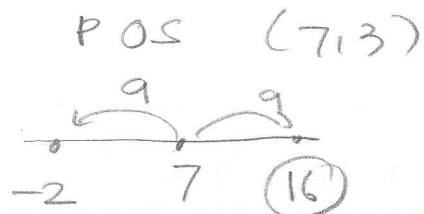
$(10, -6)$



$(12, 13)$

$(4, -6)$

④



(16,10)

(4,12)

⑤

$$x^2 + 2xy + 4 = 0$$

x axis: switch y to -y

$$x^2 + 2x(-y) + 4 = 0 \rightarrow x^2 - 2xy + 4 = 0 \rightarrow \text{no}$$

y axis: switch x to -x

$$(-x)^2 + 2(-x)y + 4 = 0 \rightarrow x^2 - 2xy + 4 = 0 \rightarrow \text{no}$$

origin: switch x to -x and y to -y

$$(-x)^2 + 2(-x)(-y) + 4 = 0 \rightarrow x^2 + 2xy + 4 = 0 \rightarrow \text{yes}$$

y=x: switch x & y

$$y^2 + 2yx + 4 = 0 \rightarrow \text{no}$$

⑥ $f(x) = \frac{x}{x^2 - 4}$

$$x^2 - 4 \neq 0$$

$$x^2 \neq 4$$

$$x \neq \pm 2$$

⑦ $f(x) = \frac{x}{\sqrt{x^2 - 4}}$

$$x^2 - 4 > 0$$

$$(x+2)(x-2) > 0$$



$$x > 2 \text{ OR } x < -2$$

⑧ $f(x) = \sqrt{x^2 - 5x + 6}$

$$x^2 - 5x + 6 \geq 0$$

$$(x-2)(x-3) \geq 0$$



$$x \geq 3 \text{ OR } x \leq 2$$

7

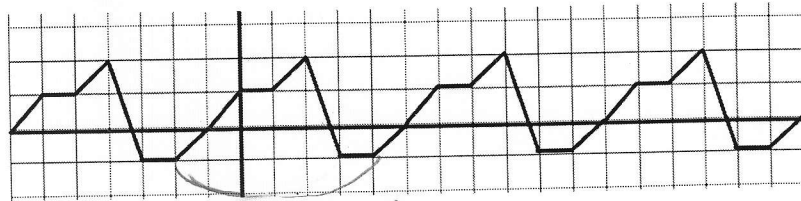
a) period = 6

c) $\frac{45}{6} = 7R3$

$f(3) = -1$

b) amplitude = $\frac{3}{2}$

d) $\frac{+70}{6} = 11R4 \rightarrow f(-4) = 2$

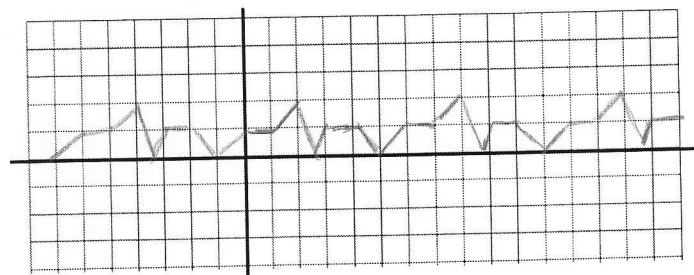


7. Find:

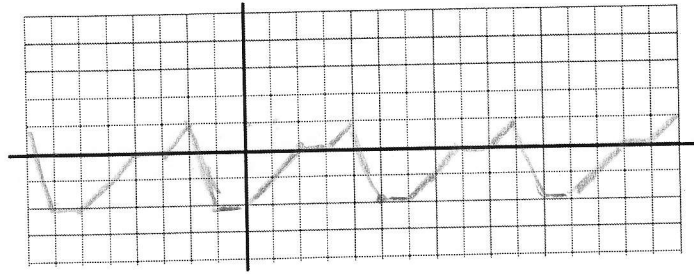
- a) period
- c) $f(45)$

- b) amplitude
- d) $f(-70)$

8. $y = |f(x)|$ 1 period

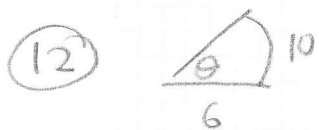


9) $y+1 = f(x-2)$ right 2 down 1



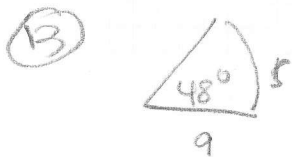
$$(10) \frac{140^\circ}{1} \cdot \frac{\pi \text{ radians}}{180^\circ} = \frac{7\pi}{9}$$

$$(11) \frac{5\pi}{9} \cdot \frac{180^\circ}{\pi} = 100^\circ$$



$$S = r\theta$$

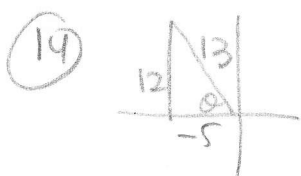
$$10 = 6\theta \rightarrow \theta = \frac{10}{6} = \frac{5}{3}$$



$$S =$$

$$\frac{48^\circ}{360^\circ} \cdot 2\pi \cdot 9 = \frac{12\pi}{5} \text{ in}$$

$$\text{Area} = \frac{48^\circ}{360^\circ} \cdot \pi \cdot 9^2 = \frac{54\pi}{5} \text{ in}^2$$



$$\sin\theta = \frac{12}{13}$$

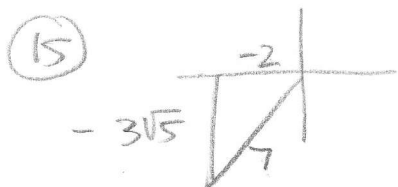
$$\cos\theta = \frac{-5}{13}$$

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

$$\csc\theta = \frac{13}{12}$$

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

$$\cot\theta = -\frac{5}{12}$$



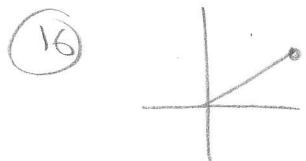
$$(-2)^2 + y^2 = 7^2$$

$$4 + y^2 = 49$$

$$y^2 = 45$$

$$y = 3\sqrt{5}$$

$$\sin\theta = \frac{-3\sqrt{5}}{7}$$



$$\cos 30^\circ = \frac{\sqrt{3}}{2}$$



$$\sin 45^\circ = \frac{\sqrt{2}}{2} \rightarrow \csc 45^\circ = \frac{2}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$$



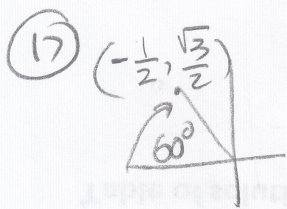
$$\tan 225^\circ = 1 \quad \tan \text{ is pos in Q III}$$

d) $\cot \frac{4\pi}{3}$ Quadrant III \cot is pos
~~mm~~ $\frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

e) $\sin \frac{3\pi}{4}$ Q II \sin is pos = $\frac{\sqrt{2}}{2}$
~~mm~~

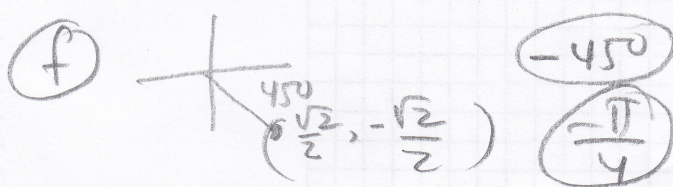
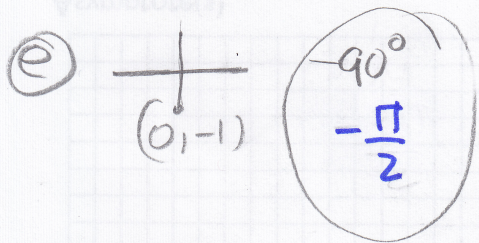
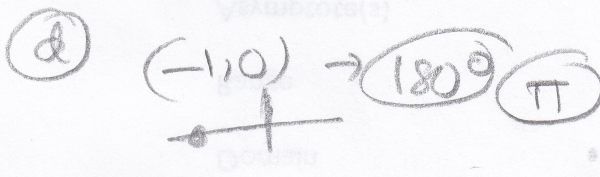
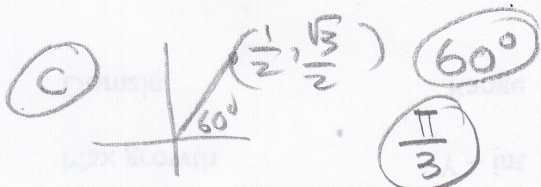
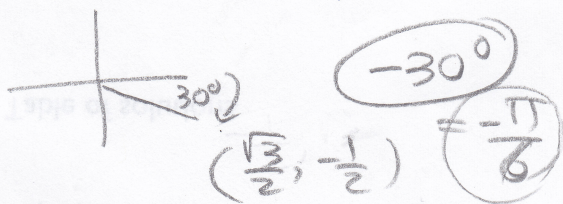
f) $\sec \frac{7\pi}{6} \rightarrow \cos \frac{7\pi}{6}$ Q II \cos is neg

~~mm~~ $\cos \frac{7\pi}{6} = -\frac{\sqrt{3}}{2} \rightarrow \sec \frac{7\pi}{6} = \frac{-2}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$



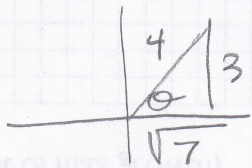
$180^\circ - 60^\circ = 120^\circ$
 $\frac{2\pi}{3}$

b)

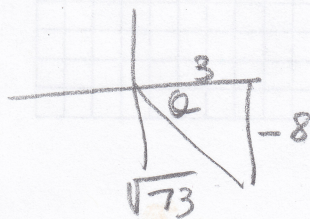


18a) $\cos \sin^{-1}(\frac{3}{4})$

18b) $\csc \tan^{-1}(-\frac{8}{3})$

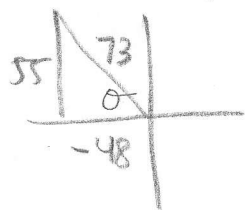


$\cos \theta = \frac{4}{5}$



$\csc \theta = \frac{\sqrt{73}}{-8} = -\frac{\sqrt{73}}{8}$

18c



$$(-48)^2 + y^2 = 73^2$$

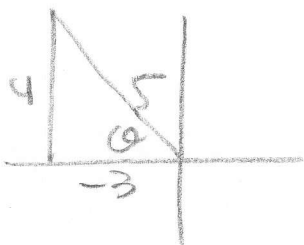
$$y^2 = 3025$$

$$y = 55$$

$$\cos\left(\cos^{-1}\left(-\frac{48}{73}\right)\right) = -\frac{48}{73}$$

18d

$$\tan \cos^{-1}\left(-\frac{3}{5}\right)$$



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

19

$$-115^\circ + 360^\circ = 245^\circ$$

$$-115^\circ - 360^\circ = -475^\circ$$

20

$$-\frac{11\pi}{4} + 2\pi = -\frac{3\pi}{4}$$

$$-\frac{11\pi}{4} + 2(2\pi) = \frac{5\pi}{4}$$

21

$$\cos(-530^\circ) = \cos(-530^\circ + 2 \cdot 360^\circ) = \cos 170^\circ$$

$$\text{Q II } 180^\circ - 170^\circ = 10^\circ$$

$$\cos \text{ is neg in Q II } \rightarrow -\cos 10^\circ$$

22

$$\theta = 40^\circ$$

$$m = \tan 40^\circ \approx .84$$

$$y - 2 = .84(x - 3)$$

$$y - 2 = .84x - 2.52$$

$$y = .84x - .52$$

23

$$8x + 3y = 10$$

$$3y = -8x + 10$$

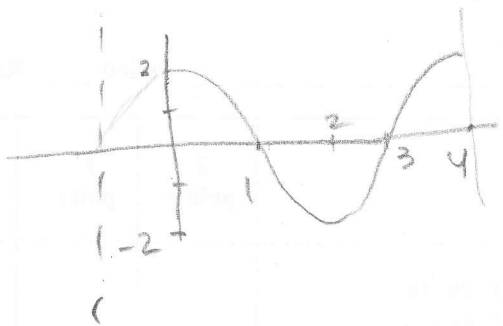
$$y = -\frac{8}{3}x + \frac{10}{3}$$

$$m = 180^\circ - \tan^{-1}\left(\frac{8}{3}\right)$$

$$= 180^\circ - 69.4^\circ$$

$$= 110.6^\circ$$

24



amplitude = 2

AOW: $y=0$

$$\text{Per} = 4 = \frac{2\pi}{B}$$

$$4B = 2\pi \rightarrow B = \frac{\pi}{2}$$

$$y = 2 \sin \frac{\pi}{2} (x+1)$$

25 $y = 2 \cos \frac{\pi}{2} x$

26 $y = 2 - 3 \cos 2(x - \frac{\pi}{2})$

amplitude = 3

AOW: $y=2$

$$B = 2 =$$

$$\text{Per} = \frac{2\pi}{2} = \pi$$

$$\text{Scale} = \frac{\pi}{4}$$

phase shift: right $\frac{\pi}{2}$

