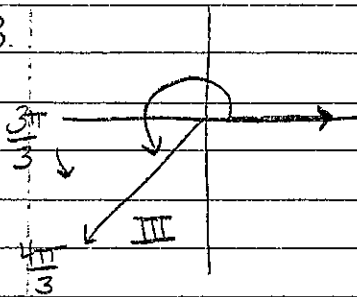


3.



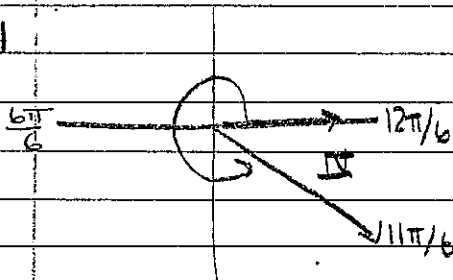
$$\frac{4\pi}{3} \pm 2\pi$$

$$\frac{2\pi \cdot 3}{1 \cdot 3} = \frac{6\pi}{3}$$

$$\frac{4\pi}{3} - \frac{6\pi}{3} = \boxed{\frac{-2\pi}{3}}$$

$$\frac{4\pi}{3} + \frac{6\pi}{3} = \boxed{\frac{10\pi}{3}}$$

4.



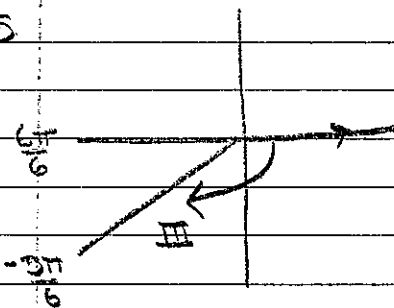
$$\frac{11\pi}{6} \pm 2\pi$$

$$\frac{2\pi \cdot 6}{1 \cdot 6} = \frac{12\pi}{6}$$

$$\frac{11\pi}{6} - \frac{12\pi}{6} = \boxed{\frac{-\pi}{6}}$$

$$\frac{11\pi}{6} + \frac{12\pi}{6} = \boxed{\frac{23\pi}{6}}$$

5.



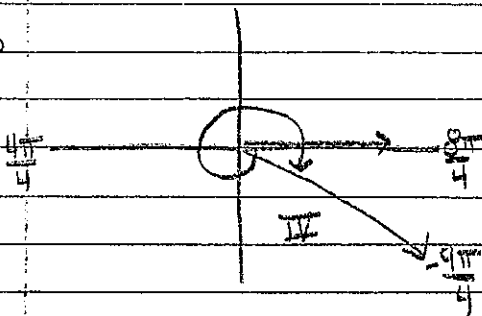
$$-\frac{5\pi}{6} \pm 2\pi$$

$$\frac{2\pi \cdot 6}{1 \cdot 6} = \frac{12\pi}{6}$$

$$-\frac{5\pi}{6} - \frac{12\pi}{6} = \boxed{\frac{-17\pi}{6}}$$

$$-\frac{5\pi}{6} + \frac{12\pi}{6} = \boxed{\frac{7\pi}{6}}$$

6.



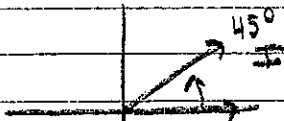
$$-\frac{9\pi}{4} \pm 2\pi$$

$$\frac{2\pi \cdot 4}{1 \cdot 4} = \frac{8\pi}{4}$$

$$-\frac{9\pi}{4} + \frac{8\pi}{4} = \boxed{\frac{-\pi}{4}}$$

$$\frac{-\pi}{4} + \frac{8\pi}{4} = \boxed{\frac{7\pi}{4}}$$

7.

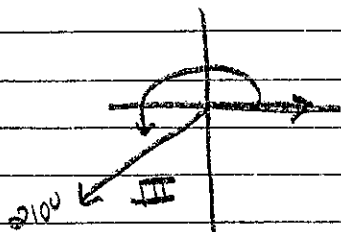


$$45^\circ \pm 360^\circ$$

$$45^\circ + 360^\circ = \boxed{405^\circ}$$

$$45^\circ - 360^\circ = \boxed{-315^\circ}$$

8.

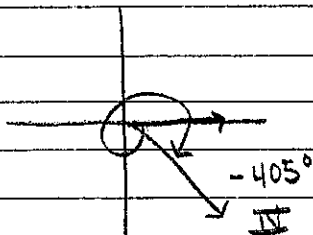


$$210^\circ \pm 360^\circ$$

$$210^\circ + 360^\circ = \boxed{570^\circ}$$

$$210^\circ - 360^\circ = \boxed{-150^\circ}$$

9.

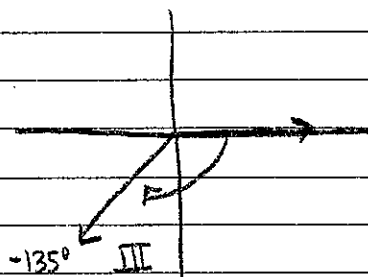


$$-405^\circ \pm 360^\circ$$

$$-405^\circ + 360^\circ = \boxed{-45^\circ}$$

$$-45^\circ + 360^\circ = \boxed{315^\circ}$$

10.



$$-135^\circ \pm 360^\circ$$

$$-135^\circ + 360^\circ = \boxed{225^\circ}$$

$$-135^\circ - 360^\circ = \boxed{-495^\circ}$$

$$11. \quad \frac{-90^\circ}{1} \cdot \frac{\pi}{180^\circ} = \boxed{-\pi/2}$$

$$12. \quad \frac{225^\circ}{1} \cdot \frac{\pi}{180^\circ} = \frac{225\pi}{180}$$

$$\frac{225 \div 45}{180 \div 45} = \frac{5}{4} \cdot \pi \quad \boxed{\frac{5\pi}{4}}$$

$$16. \quad \frac{-3\pi}{8} \cdot \frac{180^\circ}{\pi} = \boxed{-108^\circ}$$

	question	Complement	Supplement
27.	$\pi/8$	$4\left(\frac{\pi}{2}\right) - \frac{\pi}{8} = \frac{4\pi}{8} - \frac{\pi}{8}$ $= \frac{3\pi}{8}$	$8\left(\frac{\pi}{1}\right) - \frac{\pi}{8} = \frac{8\pi}{8} - \frac{\pi}{8} = \frac{7\pi}{8}$
28.	$\pi/12$	$6\left(\frac{\pi}{2}\right) - \frac{\pi}{12} = \frac{6\pi}{12} - \frac{\pi}{12}$ $= \frac{5\pi}{12}$	$12\left(\frac{\pi}{1}\right) - \frac{\pi}{12} = \frac{12\pi}{12} - \frac{\pi}{12} = \frac{11\pi}{12}$
29.	$7\pi/10$	$5\left(\frac{\pi}{2}\right) - \frac{7\pi}{10} = \frac{5\pi}{10} - \frac{7\pi}{10}$ $= -2\pi/10$ <p style="text-align: center;">Not possible</p>	$10\left(\frac{\pi}{1}\right) - \frac{7\pi}{10} = \frac{10\pi}{10} - \frac{7\pi}{10}$ $= \frac{3\pi}{10}$
31.	5°	$90^\circ - 5^\circ = 85^\circ$	$180^\circ - 5^\circ = 175^\circ$
32.	84°	$90^\circ - 84^\circ = 6^\circ$	$180^\circ - 84^\circ = 96^\circ$
33.	253°	$90^\circ - 253^\circ = -163^\circ$ <p style="text-align: center;">Not possible</p>	$180^\circ - 253^\circ = -73^\circ$ <p style="text-align: center;">Not possible</p>

49

$$\frac{4\pi}{3}$$

$$\sin: \frac{-\sqrt{3}/2}{}$$

$$\csc: \frac{-2\sqrt{3}/3}{}$$

$$\cos: \frac{-1/2}{}$$

$$\sec: \frac{-2}{}$$

$$\tan: \frac{\sqrt{3}}{}$$

$$\cot: \frac{\sqrt{3}/3}{}$$

50

$$\frac{7\pi}{6}$$

$$\sin: \frac{-1/2}{}$$

$$\csc: \frac{-2}{}$$

$$\cos: \frac{-\sqrt{3}/2}{}$$

$$\sec: \frac{-2\sqrt{3}/3}{}$$

$$\tan: \frac{\sqrt{3}/3}{}$$

$$\cot: \frac{\sqrt{3}}{}$$

51

$$4\pi$$

$$\sin: \frac{0}{}$$

$$\csc: \frac{\text{und}}{}$$

$$\cos: \frac{1}{}$$

$$\sec: \frac{1}{}$$

$$\tan: \frac{0}{}$$

$$\cot: \frac{\text{und}}{}$$

52

$$-\pi$$

$$\sin: \frac{0}{}$$

$$\csc: \frac{\text{und}}{}$$

$$\cos: \frac{-1}{}$$

$$\sec: \frac{-1}{}$$

$$\tan: \frac{0}{}$$

$$\cot: \frac{\text{und}}{}$$

53

$$\frac{-11\pi}{6}$$

$$\sin: \frac{1/2}{}$$

$$\csc: \frac{2}{}$$

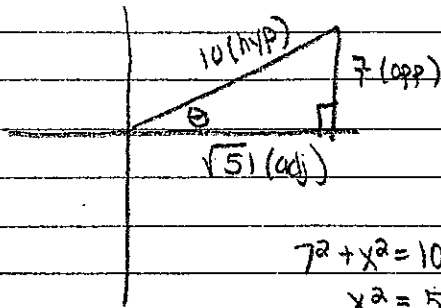
$$\cos: \frac{\sqrt{3}/2}{}$$

$$\sec: \frac{2\sqrt{3}/3}{}$$

$$\tan: \frac{\sqrt{3}/3}{}$$

$$\cot: \frac{\sqrt{3}}{}$$

73. $\sin \theta = \frac{7 \rightarrow \text{opp}}{10 \rightarrow \text{hyp}}$



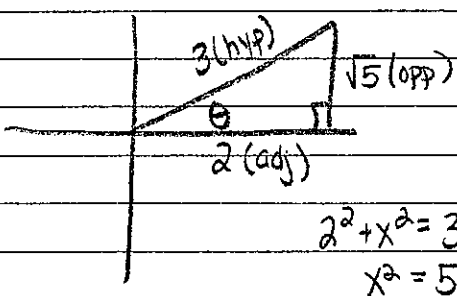
$$7^2 + x^2 = 10^2$$

$$x^2 = 51$$

$$x = \sqrt{51}$$

$\sin: \frac{7}{10}$ $\csc: \frac{10}{7}$
 $\cos: \frac{\sqrt{51}}{10}$ $\sec: \frac{10\sqrt{51}}{51}$
 $\tan: \frac{7\sqrt{51}}{51}$ $\cot: \frac{\sqrt{51}}{7}$

74. $\cos \theta = \frac{2 \rightarrow \text{adj}}{3 \rightarrow \text{hyp}}$



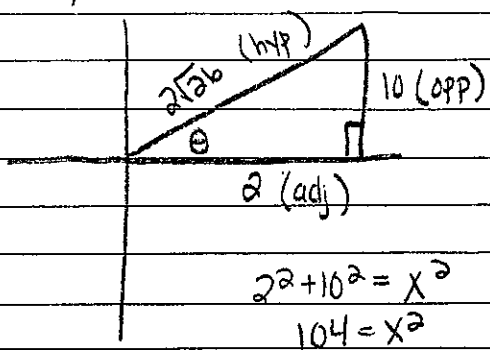
$$2^2 + x^2 = 3^2$$

$$x^2 = 5$$

$$x = \sqrt{5}$$

$\sin: \frac{\sqrt{5}}{3}$ $\csc: \frac{3\sqrt{5}}{5}$
 $\cos: \frac{2}{3}$ $\sec: \frac{3}{2}$
 $\tan: \frac{\sqrt{5}}{2}$ $\cot: \frac{2\sqrt{5}}{5}$

86. $(2, 10)$
x y



$$2^2 + 10^2 = x^2$$

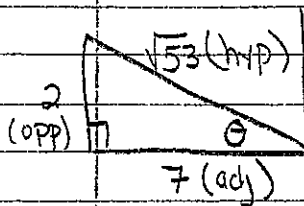
$$104 = x^2$$

$$\sqrt{4} \cdot \sqrt{26}$$

$$x = 2\sqrt{26}$$

$\sin: \frac{10}{2\sqrt{26}} = \frac{5}{\sqrt{26}} = \frac{5\sqrt{26}}{26}$
 $\csc: \frac{\sqrt{26}}{5}$
 $\cos: \frac{2}{2\sqrt{26}} = \frac{1}{\sqrt{26}} = \frac{\sqrt{26}}{26}$
 $\sec: \sqrt{26}$
 $\tan: \frac{10}{2} = 5$
 $\cot: \frac{1}{5}$

87. $(-7, 2)$



$$7^2 + 2^2 = x^2$$

$$53 = x^2$$

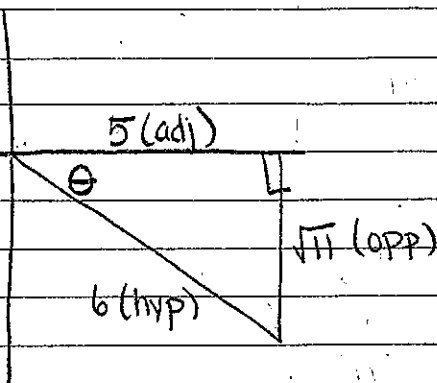
$$x = \sqrt{53}$$

$$\sin: \frac{2\sqrt{53}}{53} \quad \csc: \frac{\sqrt{53}}{2}$$

$$\cos: \frac{-7\sqrt{53}}{53} \quad \sec: \frac{-\sqrt{53}}{7}$$

$$\tan: \frac{-2}{7} \quad \cot: \frac{-7}{2}$$

91. $\sec \theta = \frac{6}{5} \rightarrow \text{hyp}$, $\tan \theta < 0$ (IV)



$$5^2 + x^2 = 6^2$$

$$x^2 = 11$$

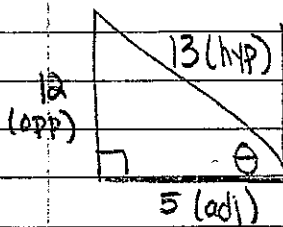
$$x = \sqrt{11}$$

$$\sin: \frac{-\sqrt{11}}{6} \quad \csc: \frac{-6\sqrt{11}}{11}$$

$$\cos: \frac{5}{6} \quad \sec: \frac{6}{5}$$

$$\tan: \frac{-\sqrt{11}}{5} \quad \cot: \frac{-5\sqrt{11}}{11}$$

94. $\tan \theta = \frac{-12}{5} \rightarrow \text{opp}$, $\sin \theta > 0$ (II)



$$12^2 + 5^2 = x^2$$

$$x^2 = 169$$

$$x = 13$$

$$\sin: \frac{12}{13} \quad \csc: \frac{13}{12}$$

$$\cos: \frac{-5}{13} \quad \sec: \frac{-13}{5}$$

$$\tan: \frac{-12}{5} \quad \cot: \frac{-5}{12}$$

103

 240°

$$\sin: \frac{-\sqrt{3}}{2}$$

$$\cos: \frac{-1}{2}$$

$$\tan: \sqrt{3}$$

104. 315°

$$\sin: \frac{-\sqrt{2}}{2}$$

$$\cos: \frac{\sqrt{2}}{2}$$

$$\tan: -1$$

105. -225°

$$\sin: \frac{\sqrt{2}}{2}$$

$$\cos: \frac{-\sqrt{2}}{2}$$

$$\tan: -1$$

$$133. f(x) = 3\sin\left(2x - \frac{\pi}{4}\right) - 1$$

$$A = 3$$

$$B = 2$$

$$C = \pi/4$$

V.S. = down 1

$$\text{Period} = \frac{2\pi}{B} = \frac{2\pi}{2} = \pi$$

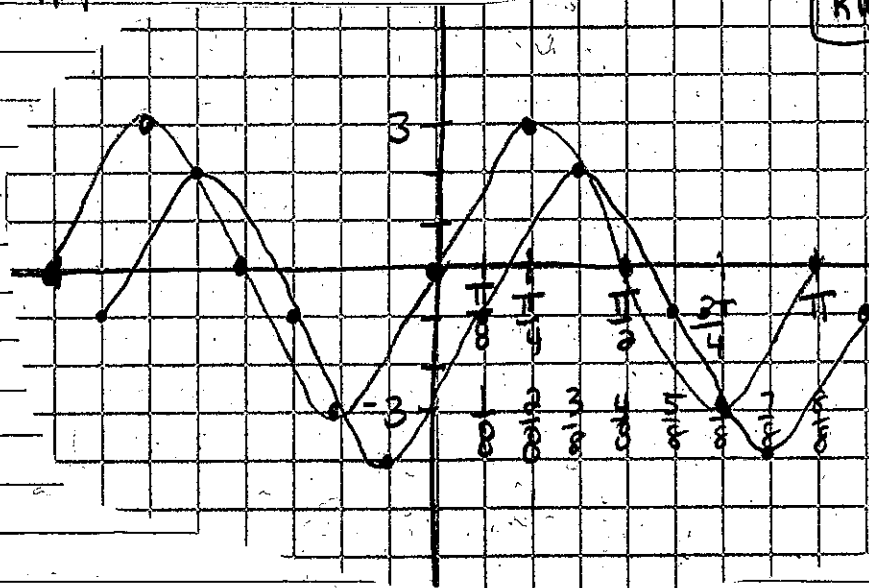
$$\text{Interval} = \frac{\text{Period}}{4} = \frac{\pi}{4}$$

$$P.S. = \frac{C}{B} = \frac{\pi/4}{2} = \frac{\pi}{4} \cdot \frac{1}{2} = \frac{\pi}{8} \text{ right}$$

X-scale: $\frac{\pi}{8}$

θ	Y
0	0
$1/4$	$\pi/4$ 3
$2/4$	$\pi/2$ 0
$3/4$	$3\pi/4$ -3
$4/4$	π 0

Right 1, down 1



$$167a. \quad -\pi/6 \quad \left\{ \quad b. \quad 5\pi/6$$

$$168a. \quad -\pi/3 \quad \left\{ \quad b. \quad 2\pi/3$$

$$169a. \quad \pi/2 \quad \left\{ \quad b. \quad -\pi/4$$

$$170a. \quad 0 \quad \left\{ \quad -\pi/3$$