

# 4.3 Packet 3 (ABCD - sin & cos)

1

Name: \_\_\_\_\_  
Period: \_\_\_\_\_

Date: \_\_\_\_\_  
Trigonometry

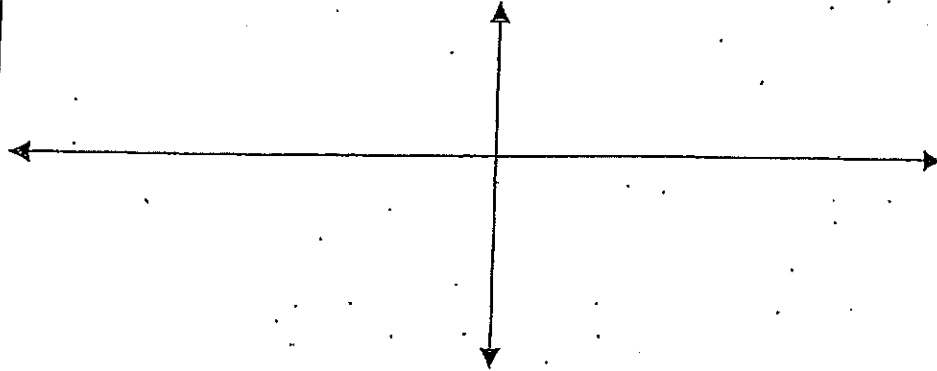
Graphing Worksheet Phase Shift (horizontal translations)

Graph two full periods.

+ keys on back

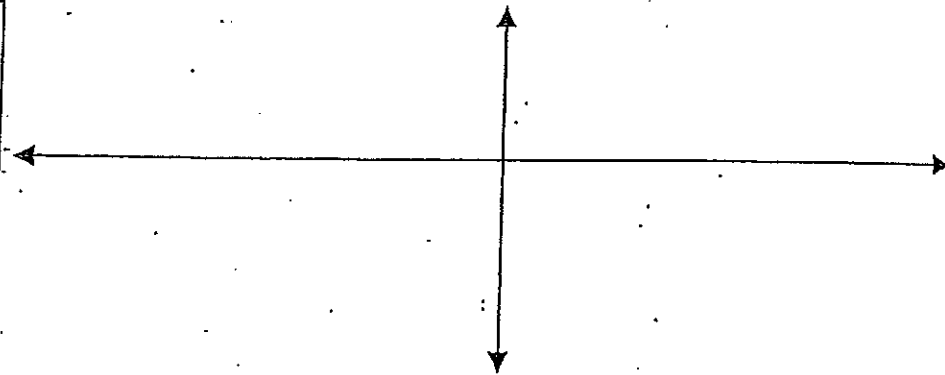
1.  $y = \cos\left(x - \frac{\pi}{4}\right)$

Amplitude= _____
B= _____
P= _____
Increment= _____
S.A.= y = _____
S,P= _____
E.P.= _____



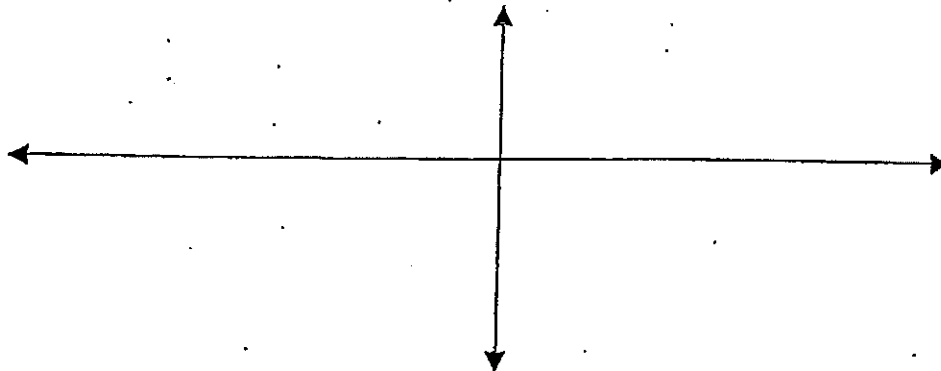
2.  $y = 3\sin(x + \pi) - 1$

Amplitude= _____
B= _____
P= _____
Increment= _____
S.A.= y = _____
S,P= _____
E.P.= _____



3.  $y = -4\cos(x - 2\pi)$

Amplitude= _____
B= _____
P= _____
Increment= _____
S.A.= y = _____
S,P= _____
E.P.= _____



Name: \_\_\_\_\_  
 Period: \_\_\_\_\_

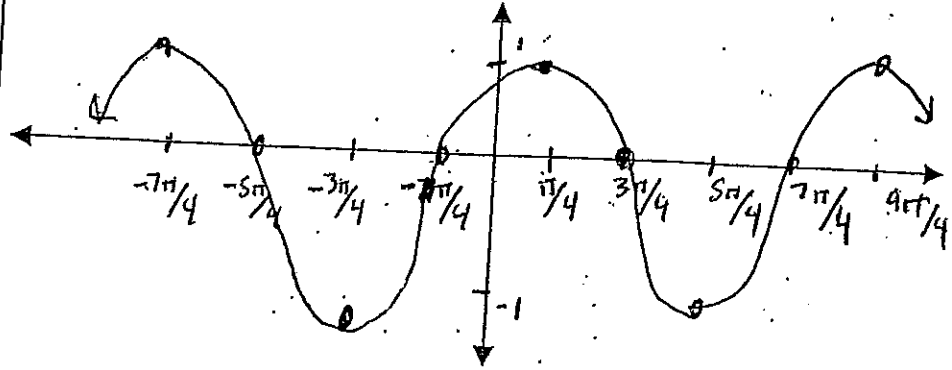
Date: \_\_\_\_\_  
 Trigonometry

Graphing Worksheet Phase Shift (horizontal translations)

Graph two full periods.

1.  $y = \cos\left(x - \frac{\pi}{4}\right)$     *Get Common Denominators*

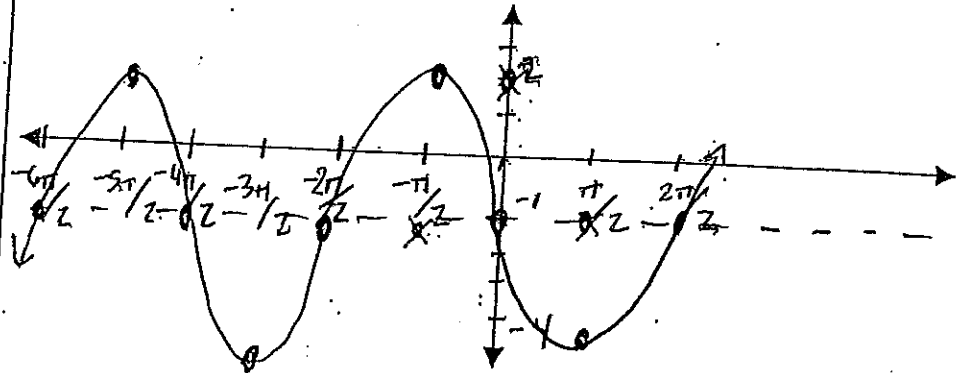
Amplitude = 1  
 B = 1  
 P =  $2\pi$   
 Increment =  $\frac{\pi}{2} = \frac{2\pi}{4}$   
 S.A. =  $y = 0$   
 S.P. =  $\frac{\pi}{4}$   
 E.P. =  $2\pi + \frac{\pi}{4} = \frac{9\pi}{4}$



$x - \frac{\pi}{4} = 0 \rightarrow x = \frac{\pi}{4}$

2.  $y = 3\sin(x + \pi) - 1$

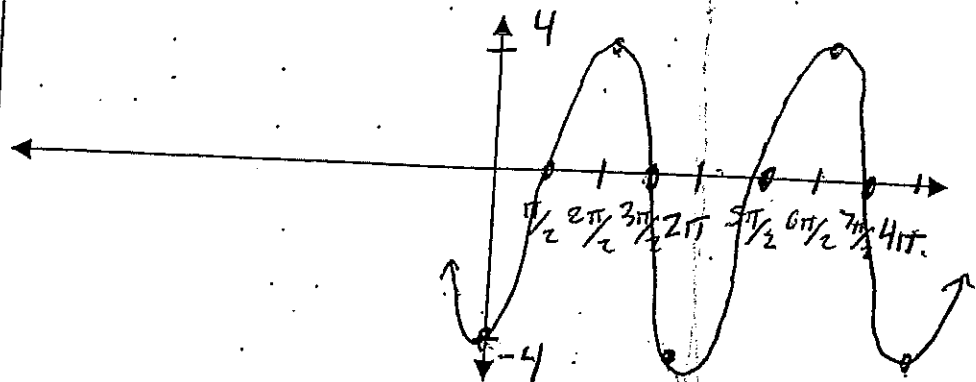
Amplitude = 3  
 B = 1  
 P =  $2\pi$   
 Increment =  $\frac{\pi}{2}$   
 S.A. =  $y = -1$   
 S.P. =  $-\pi = -\frac{2\pi}{2}$   
 E.P. =  $3\pi = -\frac{6\pi}{2}$



$x + \pi = 0$   
 $x = -\pi$

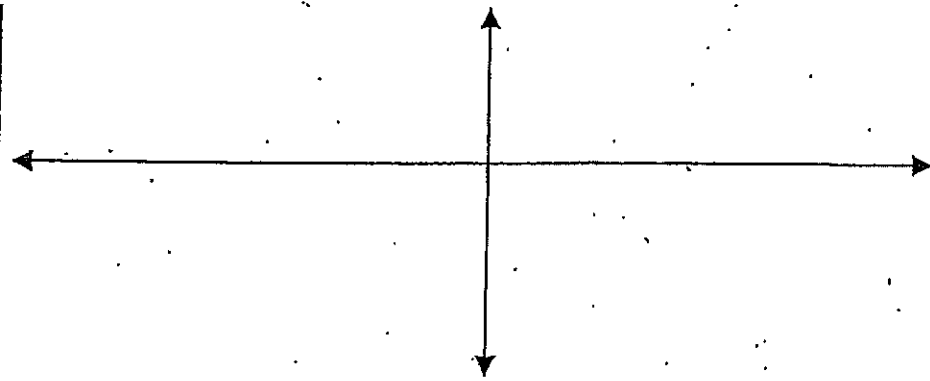
3.  $y = -4\cos(x - 2\pi)$

Amplitude = 4  
 B = 1  
 P =  $2\pi$   
 Increment =  $\frac{\pi}{2}$   
 S.A. =  $y = 0$   
 S.P. =  $2\pi = \frac{4\pi}{2}$   
 E.P. =  $4\pi = \frac{8\pi}{2}$



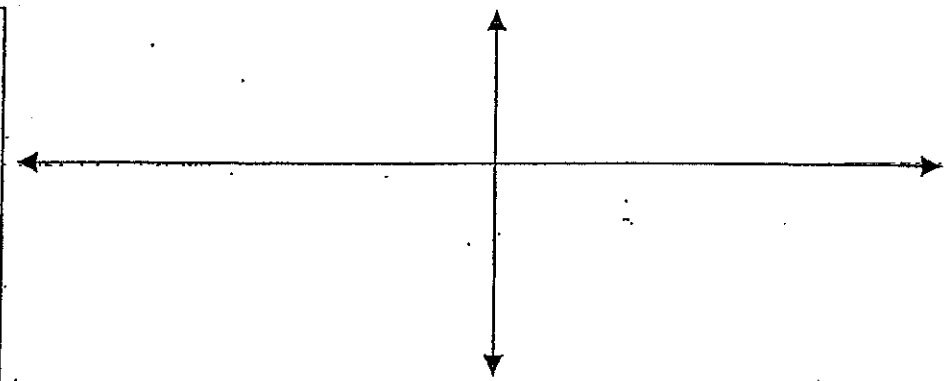
4.  $y = 4 \sin\left(2x + \frac{\pi}{3}\right)$

Amplitude= \_\_\_\_\_  
B= \_\_\_\_\_  
P= \_\_\_\_\_  
Increment= \_\_\_\_\_  
S.A.= y = \_\_\_\_\_  
S.P.= \_\_\_\_\_  
E.P.= \_\_\_\_\_



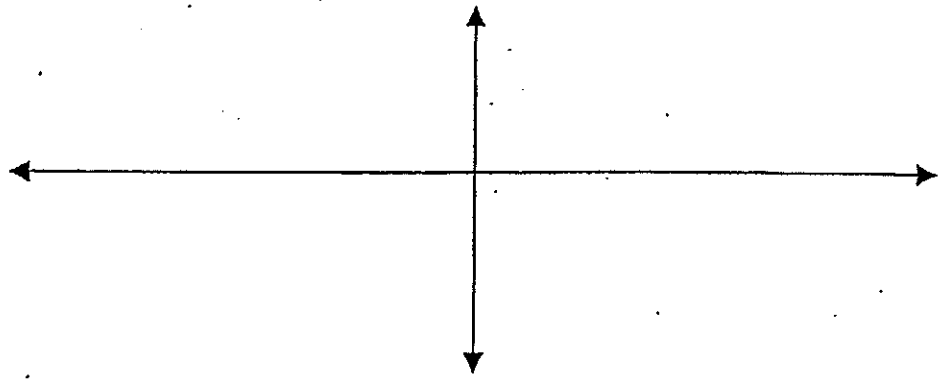
5.  $y = \cos\left(\frac{1}{2}x - \frac{\pi}{3}\right) - 3$

Amplitude= \_\_\_\_\_  
B= \_\_\_\_\_  
P= \_\_\_\_\_  
Increment= \_\_\_\_\_  
S.A.= y = \_\_\_\_\_  
S.P.= \_\_\_\_\_  
E.P.= \_\_\_\_\_



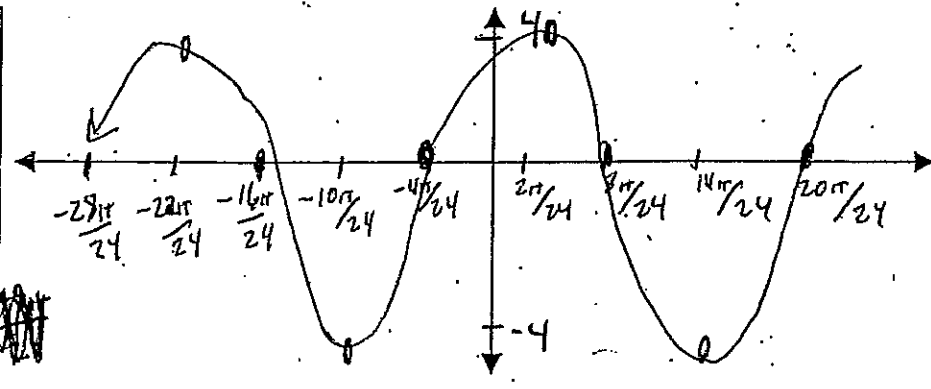
6.  $y = -4 \sin\left(3x + \frac{\pi}{4}\right) + 6$

Amplitude= \_\_\_\_\_  
B= \_\_\_\_\_  
P= \_\_\_\_\_  
Increment= \_\_\_\_\_  
S.A.= y = \_\_\_\_\_  
S.P.= \_\_\_\_\_  
E.P.= \_\_\_\_\_



4.  $y = 4\sin\left(2x + \frac{\pi}{3}\right)$

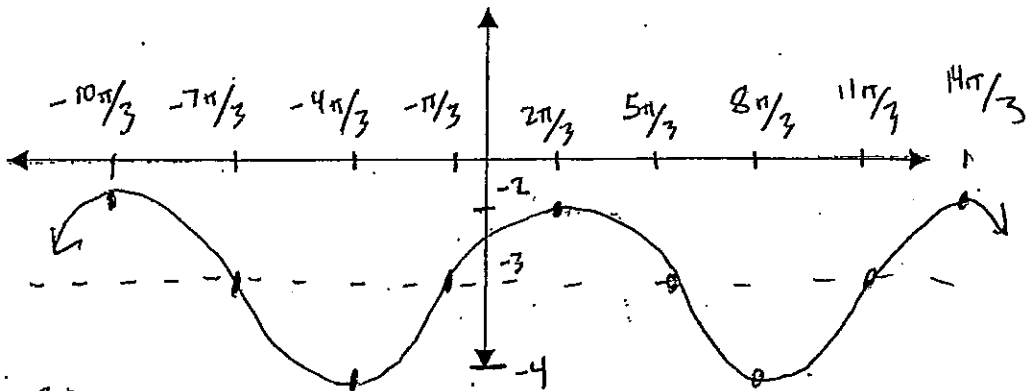
Amplitude = 4  
 B = 2  
 P =  $\frac{2\pi}{2} = \pi$   
 Increment =  $\frac{\pi}{4} = \frac{6\pi}{24}$   
 S.A. =  $y = 0$   
 S.P. =  $-\frac{\pi}{6} = -\frac{4\pi}{24}$   
 E.P. =  $\pi + (-\frac{\pi}{6}) = \frac{5\pi}{6}$



$2x + \frac{\pi}{3} = 0 \Rightarrow 2x = -\frac{\pi}{3}$   
 $x = -\frac{\pi}{6}$

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

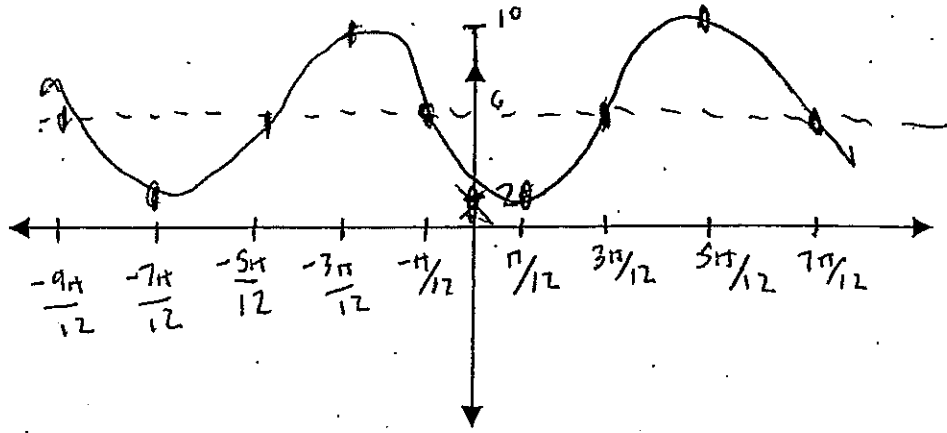
Amplitude = 1  
 B = 1/2  
 P = 4pi  
 Increment =  $\pi = \frac{3\pi}{3}$   
 S.A. =  $y = -3$   
 S.P. =  $\frac{2\pi}{3}$   
 E.P. =  $4\pi + \frac{2\pi}{3} = \frac{14\pi}{3}$



$\frac{1}{2}x - \frac{\pi}{3} = 0 \Rightarrow \frac{1}{2}x = \frac{\pi}{3} \Rightarrow x = \frac{2\pi}{3}$

6.  $y = -4\sin\left(3x + \frac{\pi}{4}\right) + 6$

Amplitude = 4  
 B = 3  
 P =  $\frac{2\pi}{3} = \frac{8\pi}{12}$   
 Increment =  $\frac{2\pi}{12}$   
 S.A. =  $y = 6$   
 S.P. =  $-\frac{\pi}{12}$   
 E.P. =  $\frac{7\pi}{12}$



$3x + \frac{\pi}{4} = 0 \Rightarrow \frac{-\pi}{12}$

Name: \_\_\_\_\_  
Period: \_\_\_\_\_

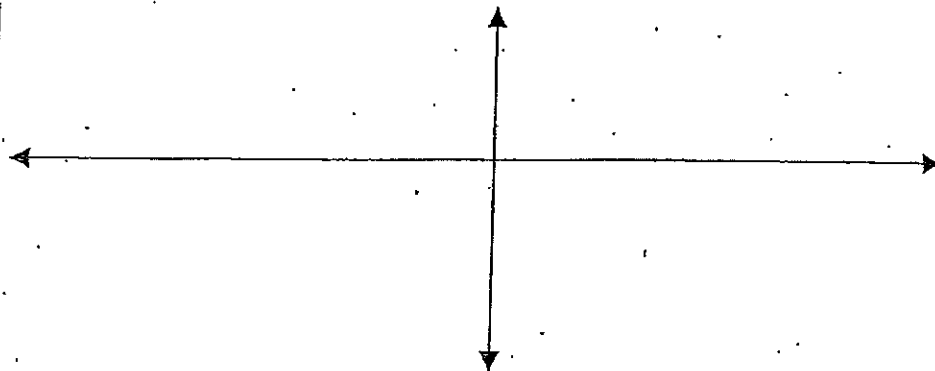
Date: \_\_\_\_\_  
Trigonometry

Graphing Worksheet 3

Graph two full periods.

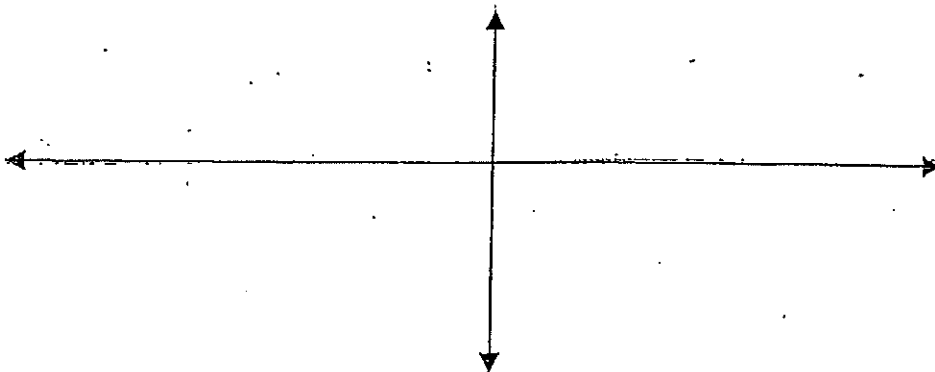
1.  $y = \cos\left(x - \frac{\pi}{4}\right)$

A= _____
Amplitude= _____
B= _____
P= _____
Increment= _____
S.A. = y = _____
S.P.= _____
E.P.= _____



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

A= _____
Amplitude= _____
B= _____
P= _____
Increment= _____
S.A. = y = _____
S.P.= _____
E.P.= _____



Name: \_\_\_\_\_  
 Period: \_\_\_\_\_

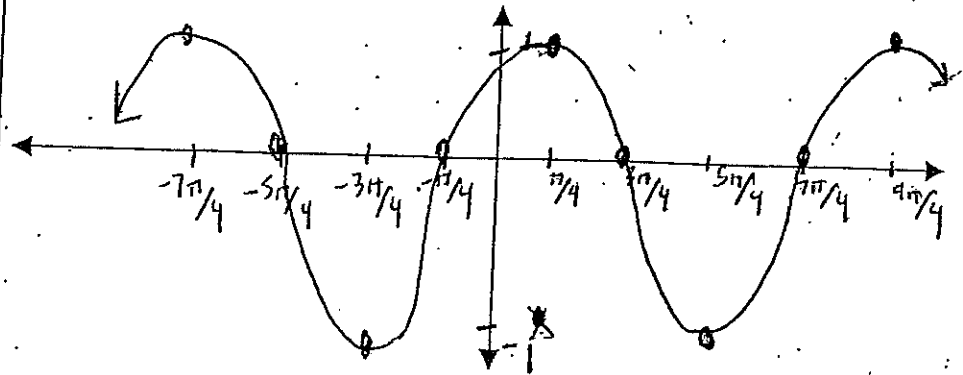
Date: \_\_\_\_\_  
 Trigonometry

Graphing Worksheet 3

Graph two full periods.

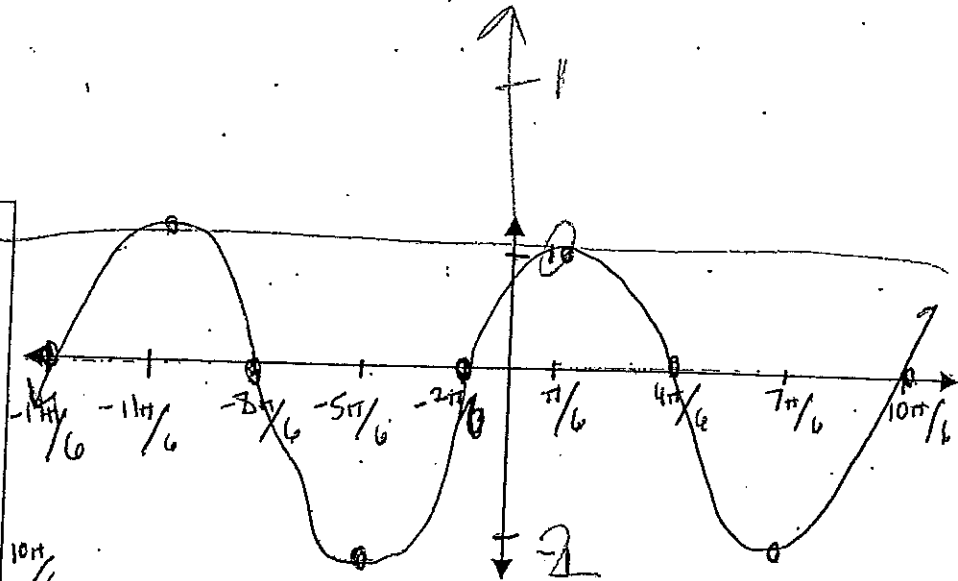
1.  $y = \cos\left(x - \frac{\pi}{4}\right)$

A =	<u>1</u>
Amplitude =	<u>1</u>
B =	<u>1</u>
P =	<u><math>2\pi</math></u>
Increment =	<u><math>\frac{\pi}{2} = \frac{2\pi}{4}</math></u>
S.A. = y =	<u>0</u>
S.P =	<u><math>\frac{\pi}{4}</math></u>
E.P. =	<u><math>\frac{\pi}{4} + 2\pi = \frac{\pi}{4} + \frac{8\pi}{4} = \frac{9\pi}{4}</math></u>



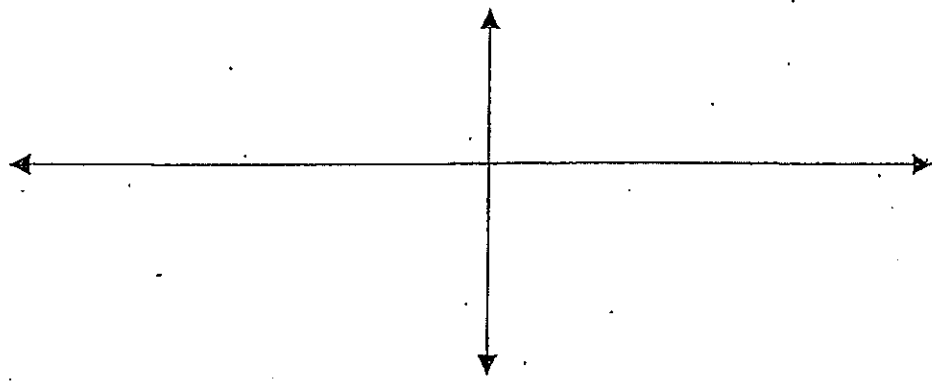
2.  $y = \sin\left(x + \frac{\pi}{3}\right) - 1$

A =	<u>1</u>
Amplitude =	<u>1</u>
B =	<u>1</u>
P =	<u><math>2\pi</math></u>
Increment =	<u><math>\frac{\pi}{2} = \frac{3\pi}{6}</math></u>
S.A. = y =	<u>-1</u>
S.P =	<u><math>-\frac{\pi}{3} = -\frac{2\pi}{6}</math></u>
E.P. =	<u><math>-\frac{\pi}{3} + \frac{6\pi}{3} = \frac{5\pi}{3} = \frac{10\pi}{6}</math></u>



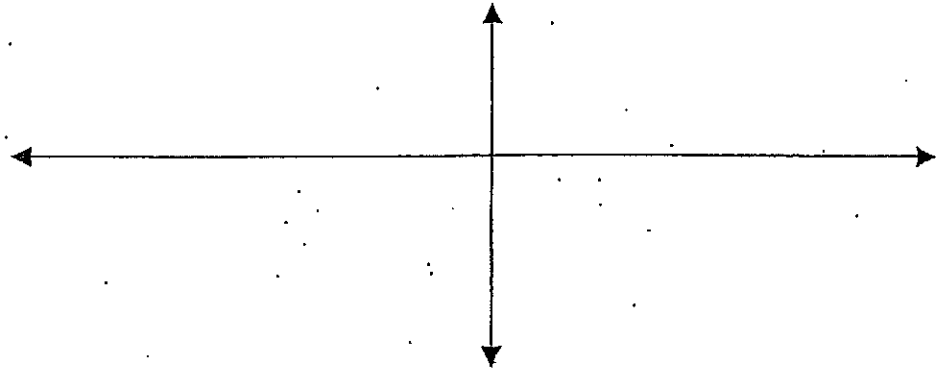
3.  $y = -3 \cos(2x + \pi)$

A= \_\_\_\_\_  
Amplitude= \_\_\_\_\_  
B= \_\_\_\_\_  
P= \_\_\_\_\_  
Increment= \_\_\_\_\_  
S.A. = y = \_\_\_\_\_  
S.P.= \_\_\_\_\_  
E.P.= \_\_\_\_\_



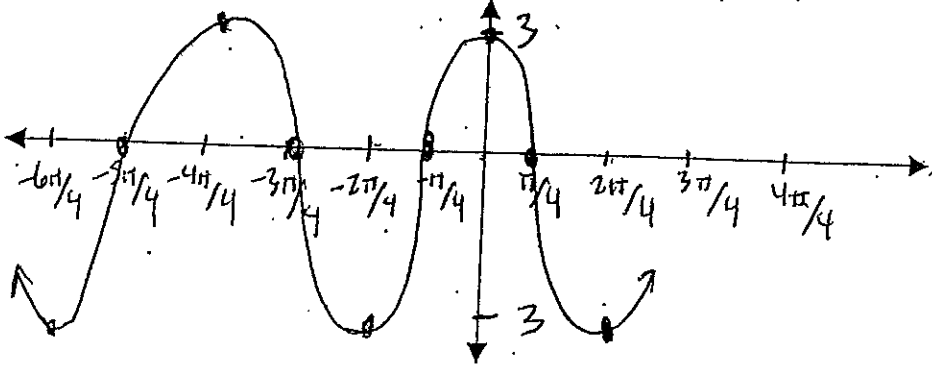
4.  $y = 2 \sin\left(2x - \frac{\pi}{2}\right)$

A= \_\_\_\_\_  
Amplitude= \_\_\_\_\_  
B= \_\_\_\_\_  
P= \_\_\_\_\_  
Increment= \_\_\_\_\_  
S.A. = y = \_\_\_\_\_  
S.P.= \_\_\_\_\_  
E.P.= \_\_\_\_\_



3.  $y = -3 \cos(2x + \pi)$

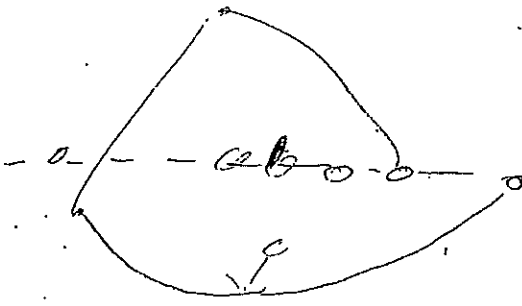
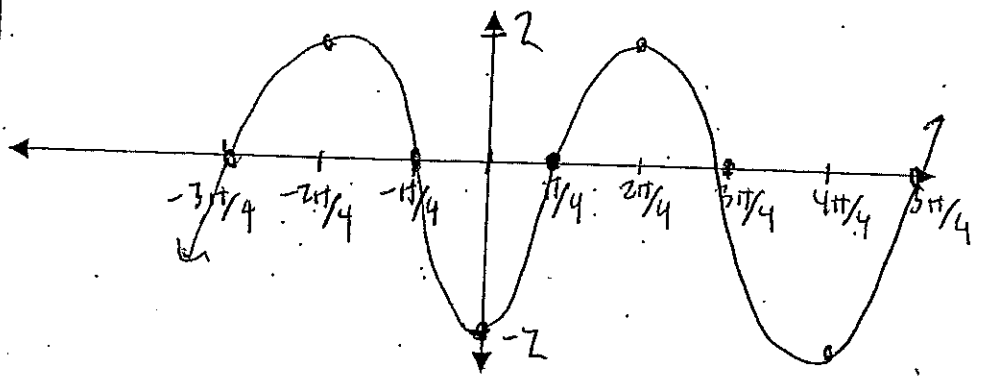
$A = \underline{-3}$   
 Amplitude =  $\underline{3}$   
 $B = \underline{2}$   
 $P = \underline{\pi}$   
 Increment =  $\underline{\pi/4}$   
 S.A. =  $y = \underline{0}$   
 S.P. =  $\underline{-\pi/2} = -2\pi/4$   
 E.P. =  $\underline{-\pi/2 + \pi} = \pi/2 = 2\pi/4$



$\rightarrow 2x + \pi = 0 \rightarrow 2x = -\pi$   
 $x = -\pi/2$

4.  $y = 2 \sin\left(2x - \frac{\pi}{2}\right)$

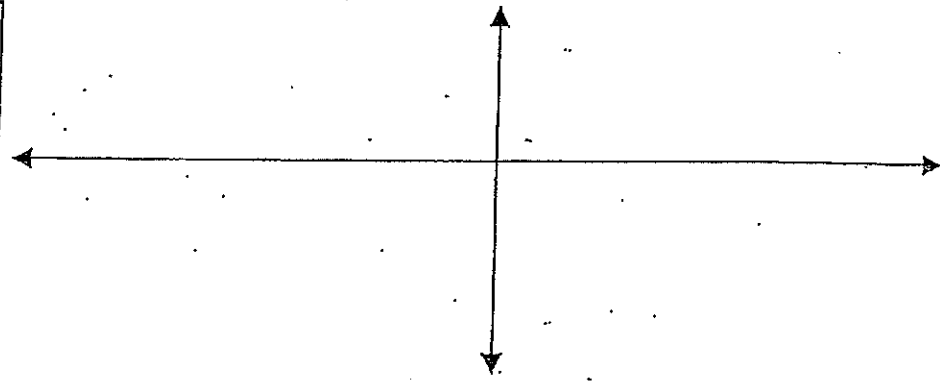
$A = \underline{2}$   
 Amplitude =  $\underline{2}$   
 $B = \underline{2}$   
 $P = \underline{\pi}$   
 Increment =  $\underline{\pi/4}$   
 S.A. =  $y = \underline{0}$   
 S.P. =  $\underline{\pi/4}$   
 E.P. =  $\underline{\pi/4 + \pi} = \underline{5\pi/4}$





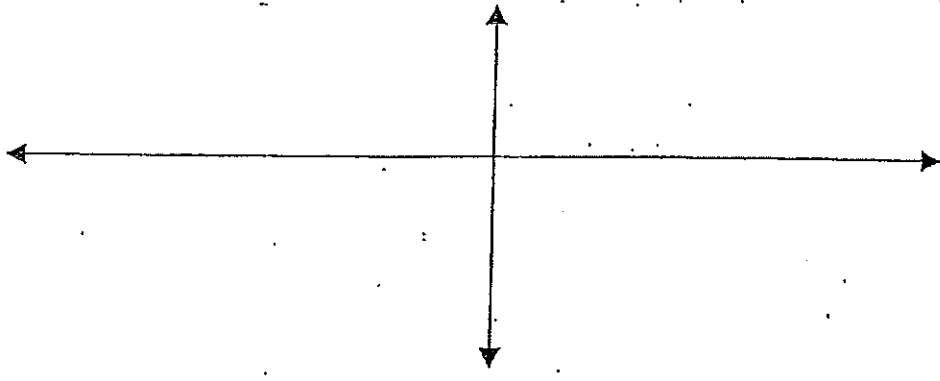
5.  $y = \cos\left(\frac{1}{2}x + \frac{\pi}{3}\right) + 1$

A= \_\_\_\_\_  
Amplitude= \_\_\_\_\_  
B= \_\_\_\_\_  
P= \_\_\_\_\_  
Increment= \_\_\_\_\_  
S.A. = y = \_\_\_\_\_  
S.P.= \_\_\_\_\_  
E.P.= \_\_\_\_\_



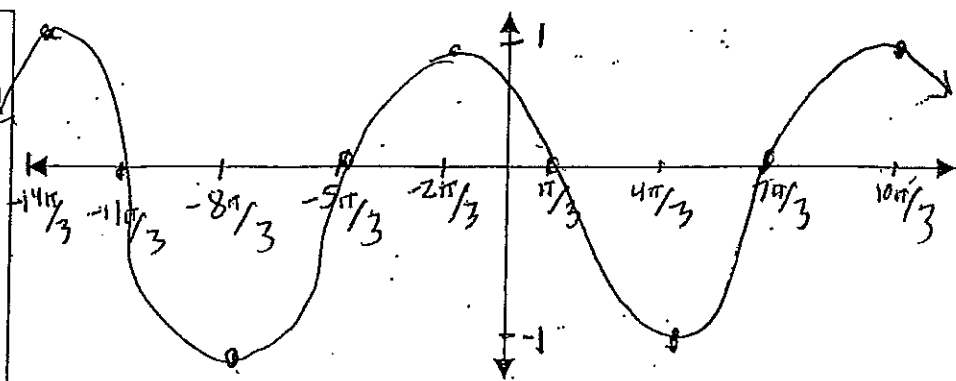
6.  $y = -\sin\left(3x - \frac{\pi}{2}\right) + 2$

A= \_\_\_\_\_  
Amplitude= \_\_\_\_\_  
B= \_\_\_\_\_  
P= \_\_\_\_\_  
Increment= \_\_\_\_\_  
S.A. = y = \_\_\_\_\_  
S.P.= \_\_\_\_\_  
E.P.= \_\_\_\_\_



5.  $y = \cos\left(\frac{1}{2}x + \frac{\pi}{3}\right) + 1$

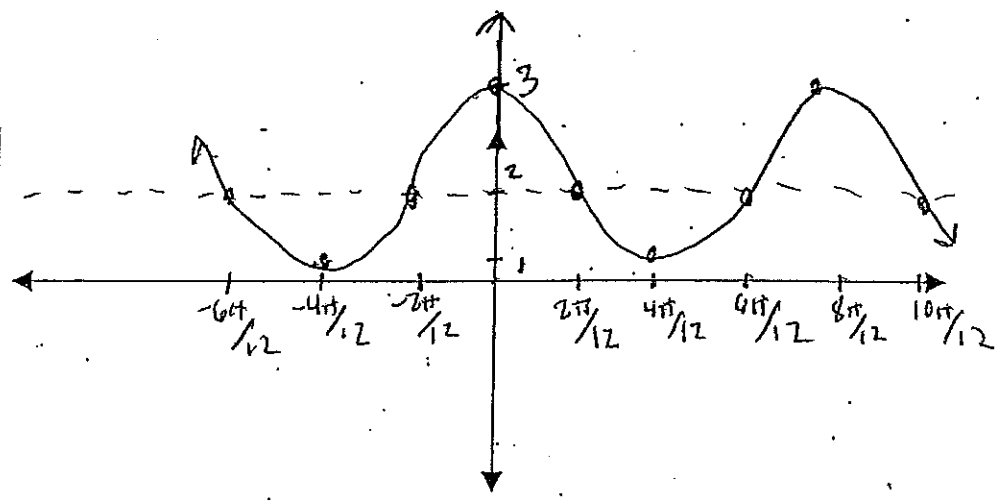
$A = 1$   
 Amplitude =  $1$   
 $B = \frac{1}{2}$   
 $P = 4\pi$   
 Increment =  $\pi = \frac{3\pi}{3}$   
 $S.A. = y = 1$   
 $S.P. = -\frac{2\pi}{3}$   
 $E.P. = -\frac{2\pi}{3} + \pi = \frac{\pi}{3}$



$\frac{1}{2}x + \frac{\pi}{3} = 0$   
 $\frac{1}{2}x = -\frac{\pi}{3}$

6.  $y = -\sin\left(3x - \frac{\pi}{2}\right) + 2$

$A = -1$   
 Amplitude =  $1$   
 $B = 3$   
 $P = \frac{2\pi}{3}$   
 Increment =  $\frac{2\pi}{12}$   
 $S.A. = y = 2$   
 $S.P. = \frac{\pi}{6} = \frac{2\pi}{12}$   
 $E.P. = \frac{2\pi}{12} + \frac{8\pi}{12} = \frac{10\pi}{12}$



$3x - \frac{\pi}{2} = 0$   
 $3x = \frac{\pi}{2}$   
 $x = \frac{\pi}{6}$