

1. State the amplitude, period, phase shift, midline, and frequency of the given equations.

a)  $y = 3 \sin \frac{3}{2}(x - 30)$   
 Amp: 3  
 Freq:  $\frac{3}{2}$   
 Period: 240  
 PS: +30  
 Mid: 0

b)  $y = \frac{1}{2} \cos 4(x) - 3$   
 Amp:  $\frac{1}{2}$   
 Freq: 4  
 Period: 90  
 PS: 0  
 Mid: -3

c)  $y = 2 \cos 3(x+90) + 4$   
 Amp: 2  
 Freq: 3  
 Period: 120  
 PS: -90  
 Mid: 4

2. Write an equation of the sine function with amplitude 6, period 270, phase shift 45, and midline of -7.

$$\frac{360}{270} = \frac{4}{3}$$

$$f(x) = 6 \sin \frac{4}{3}(x - 45) - 7$$

3. Write an equation of the cosine function with amplitude 2, frequency 4, phase shift is none, and midline of 2.

$$f(x) = 2 \cos 4(x) + 2$$

4. What is the difference between period and frequency? Draw a diagram for each and give equations.

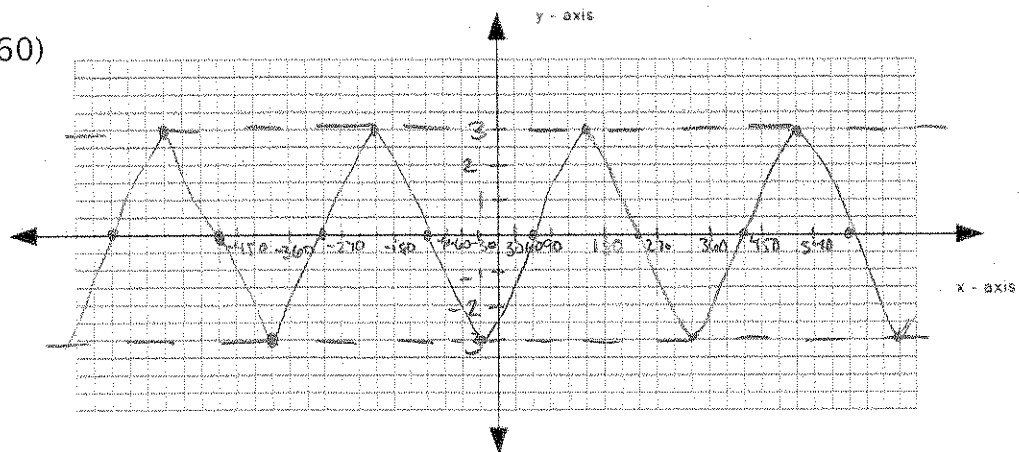
Period =  $\frac{360}{\text{Freq}}$       Freq =  $\frac{360}{\text{Period}}$   
 Period - How long it takes for one cycle, How long it takes a point to repeat itself  
 Frequency - How many periods/cycles happen in an interval of  $360^\circ$

5. Graph the following functions:



a)  $f(x) = 3 \sin(x - 60)$   
 Amp: 3  
 Freq (B): 1  
 Period: 360  
 PS: 60  
 Mid: 0

$$\frac{\text{Period}}{4} = \frac{360}{4} = 90$$



b)  $f(x) = 5\cos(x+30)-1$

Amp: 5

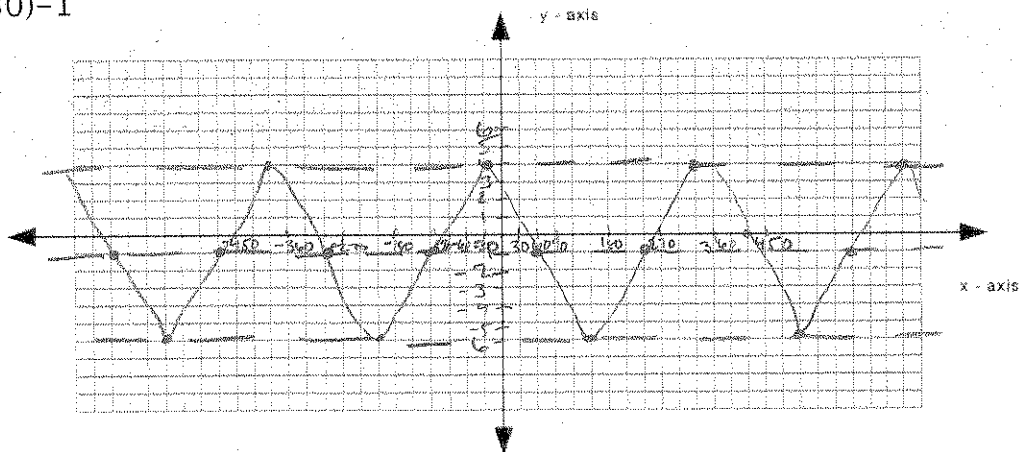
Freq (B): 1

Period: 360

PS: -30

Mid: -1

$\frac{\text{Period}}{4} = \frac{360}{4} = 90$



c)  $f(x) = -2\sin 2(x-45)+2$

Amp: 2

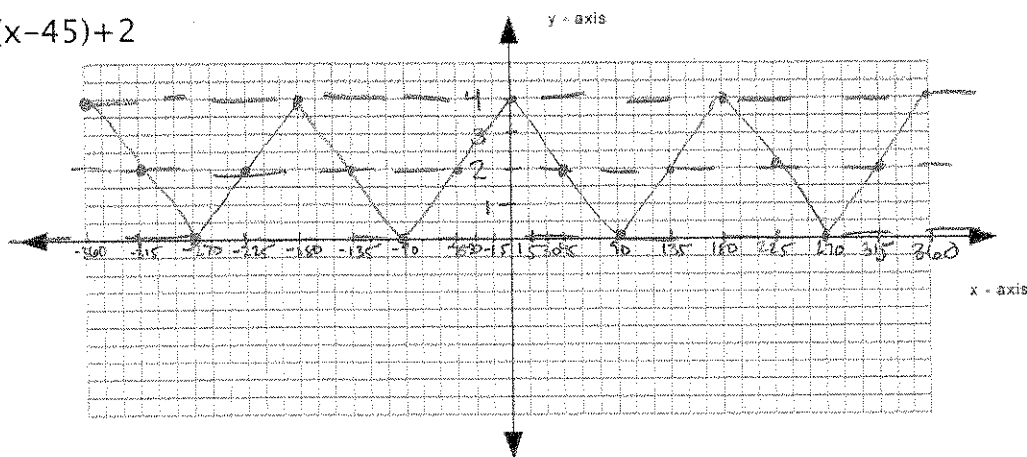
Freq (B): 2

Period: 180

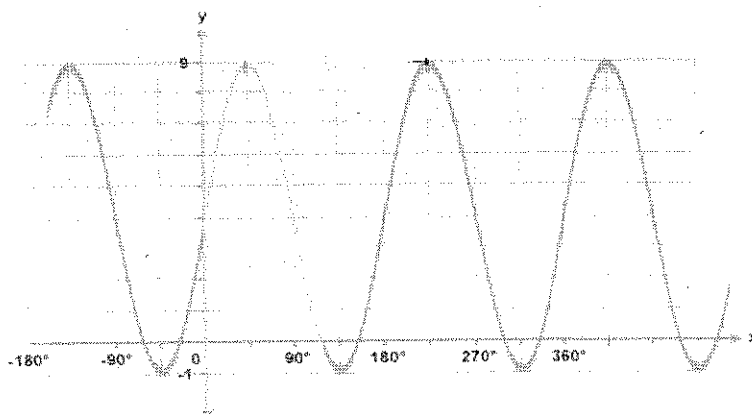
PS: 45

Mid: 2

$\frac{\text{Period}}{4} = \frac{180}{4} = 45$



6. Write a sine and cosine equation for each of the following graphs:



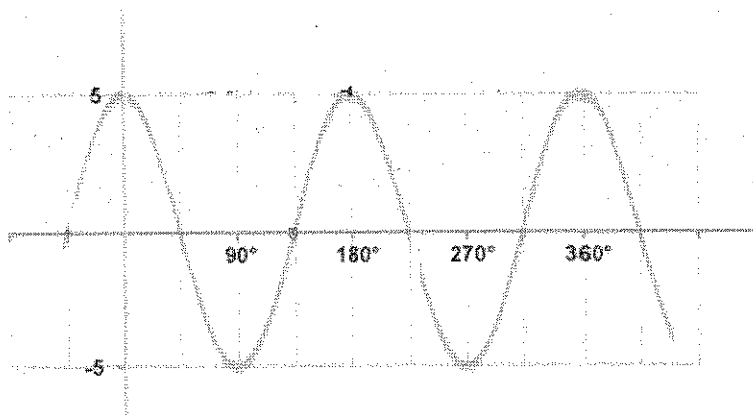
Sin:  $f(x) = 5\sin 2(x) + 4$

Cos:  $f(x) = 5\cos 2(x-45) + 4$

or  $f(x) = 5\cos 2(x+135) + 4$

Amp: 5  
Mid: 4  
Freq: 2  
Period: 180

SPS: 0  
CPS: 45, -135



Sin:  $f(x) = 5 \sin(x - 135)$  TO  
 $f(x) = 5 \sin(x + 45)$  TO

Cos:  $f(x) = 5 \cos 2(x)$

Amp: 5

Period: 180

Freq: 2

Mid: 0

SPS: 135, -45

CPS: 0