Day 6.

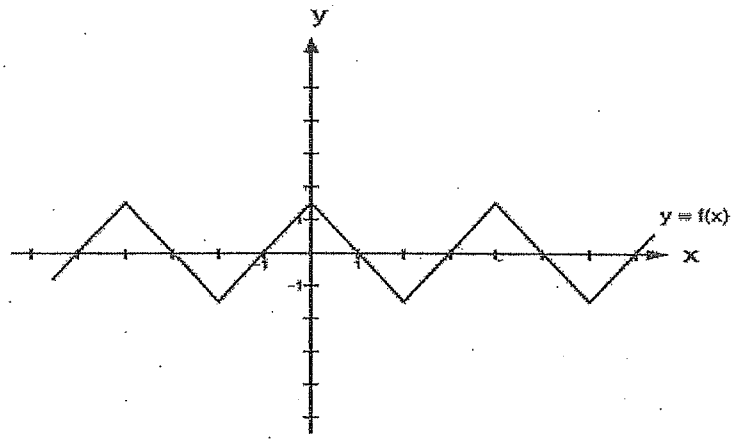
Exit Card

1. Complete the table for each of the following

	Parent Function	Amplitude	Max value	Min Value	k	Phase shift	Axis of Curve	Equation
a)	sinx	1/2	2.5	1.5	1	45° R	y=2	y = ½ sin(x-45) + 2
b)	cosx	3	5	-1	2	90	2	y=3 cos(2(x-90))+2
c)	sinx	2	0	-4	½	0	-2	y=2sin(½x) - 2
d)	cosx	4	6	-2	1	45	2	y=4 cos(x-45)+2

/12

2. The function shown is periodic.



Amplitude =	1.5
Period =	4
f(4)=	1.5
f(898)=	f(2) = -1.5

/4

3. Describe the following transformations for $y = -10\sin[3(x - 60°] + 8$ with respect to $y = sinx$.

- Reflection around x-axis
- vertically stretched by a factor of 10
- horizontally compressed by a factor of 1/3
- translation 60° to the right and 8 units up.

/5

a. Amplitude: 10

b. Period: 120°

c. Axis of Curve: y=8

d. Phase shift: 60° to the right

e. Max: 18

f. Min: -2

/6

4. Graph the following equation: $y = 3\cos(2x - 360) + 2$

$= 3\cos[2(x-180)] + 2$

2 cycles

$P = \frac{360^\circ}{2} = 180^\circ$

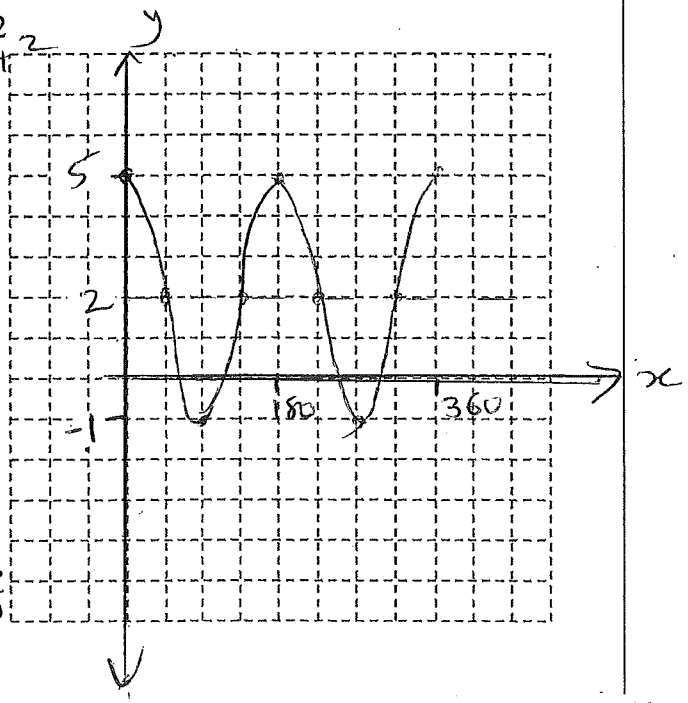
amp = 3

max = 2+3 = 5

min: 2−3 = −1

a.o.c: $y = 2$

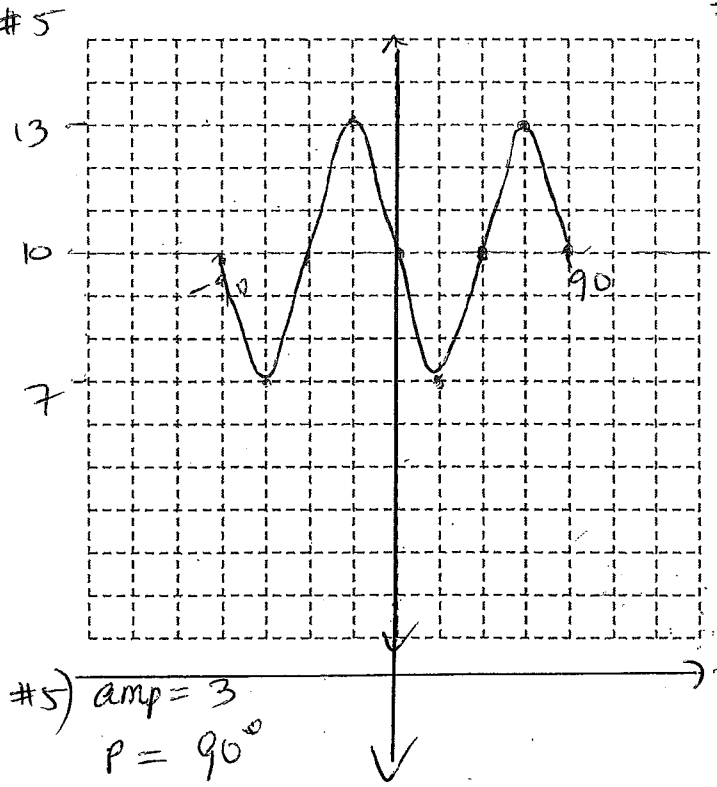
$D: \{x \in \mathbb{R} \mid 0 \le x \le 360\}$ $R = \{y \in \mathbb{R} \mid -1 \le y \le 5\}$



5. Given $y = 3\sin[4(x - 45)] + 10$, determine the amplitude, period, maximum, minimum and graph the function on the grid provided. Assume $-90 \le x \le 90$.

6. Given $y = -2\cos(2x) - 5$, determine the amplitude, period, maximum, minimum and graph the function on the grid provided. Assume $0 \le x \le 360$.

#5



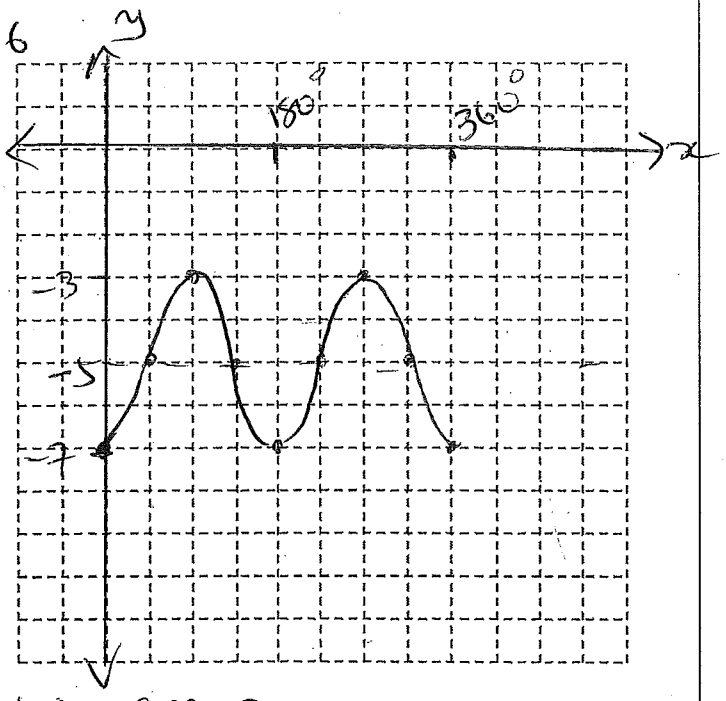
#5) amp = 3

$P = 90^\circ$

max = 13

min = 7

#6



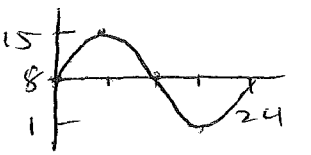
#6) amp = 2

$P = 180^\circ$

max = −3

min = −7

7. A Ferris wheel has radius of 7m. The centre of the wheel is 8 m above the ground. The Ferris wheel rotates at a constant speed of 15°/s. The height above the ground of the only red seat can be modeled by the function $h(t) = 7\sin(15°t) + 8$.



a. What is maximum height during the first rotation?

max = 8 + 7

= 15

b. When is the red seat at its maximum height during the first rotation?

From graph: $t = 6$ sec

or

$15 = 7\sin 15°t + 8$

$7 = 7\sin 15°t$

$1 = \sin 15°t$

$\sin^{-1}(1) = 15°t$

$90° = 15°t \Rightarrow t = 6$ sec.

c. How long will take for the red seat to complete two full rotations?

Period $= \frac{360°}{15°} = 24$

∴ It will take 48 seconds to complete 2 rotations.

8. State the transformations in a correct order for the following equation.

$y = \frac{1}{2}\sin(\frac{1}{3}x - 30) + 2 \quad = \frac{1}{2}\sin(\frac{1}{3}(x-90)) + 2$

- vertically compressed by a factor of $\frac{1}{2}$
- horizontally stretched by a factor of 3
- translation 90° to the right

and 2 units up.

9. Determine the equation of the function $\boldsymbol{y = 3\sin[2(x-30)] + 1}$ if:

a. the function is further stretched vertically by 2 and shifted 30 degrees right.

$y = 6\sin[2(x-60)] + 1$

b. the function is further stretched horizontally by 3 and shifted 2 units up.

$y = 3\sin[\frac{2}{3}(x-30)] + 3$

c. the function is further stretched horizontally by 1/4, vertically by 2.

$y = 6\sin[\frac{1}{2}(x-30)] + 1$