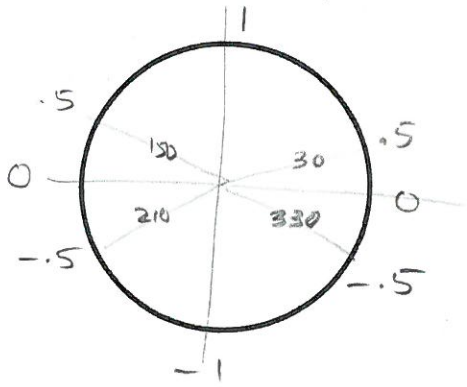
Name: Answer Key Per: _____ Date: _____

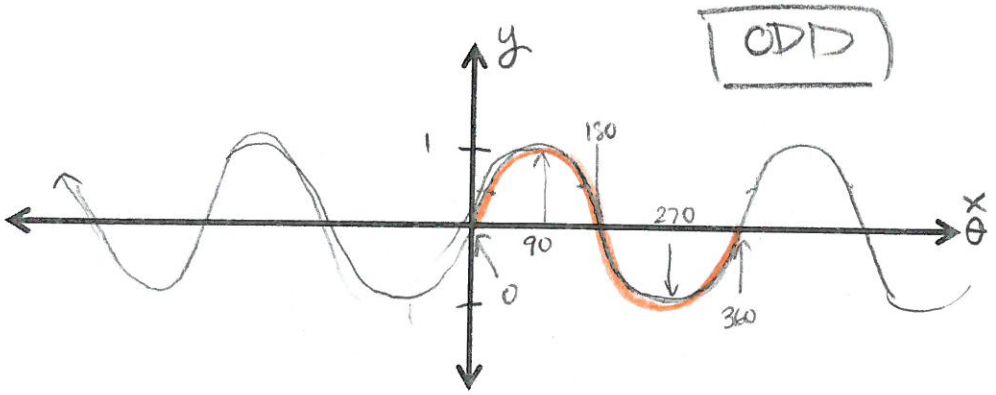
Serafino • Algebra 2E

9B1 Graphing Sinusoids – Packet 1 (AD)

SA = Sinusoidal Axis	The horizontal "average" of the function. Also called a "midline"
A = Amplitude	How many units above/below the function goes (from the SA or midline)
NP = Natural Period	The "natural period" of the parent function; how long it takes to complete one cycle
B = Frequency	How many cycles the trig function completes in its natural period
P = Period	The period of THIS function; how long to repeat the cycle? P = NP / B
I = Increment	The critical values of input (hits average, max or min) I = P/4.

The Sine Graph



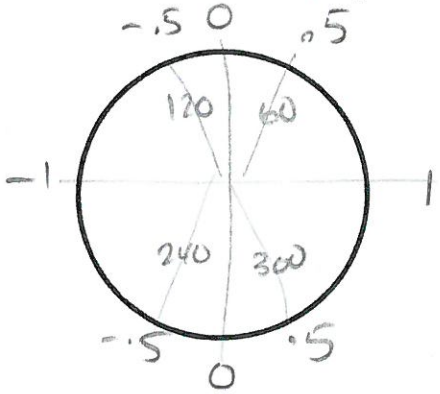


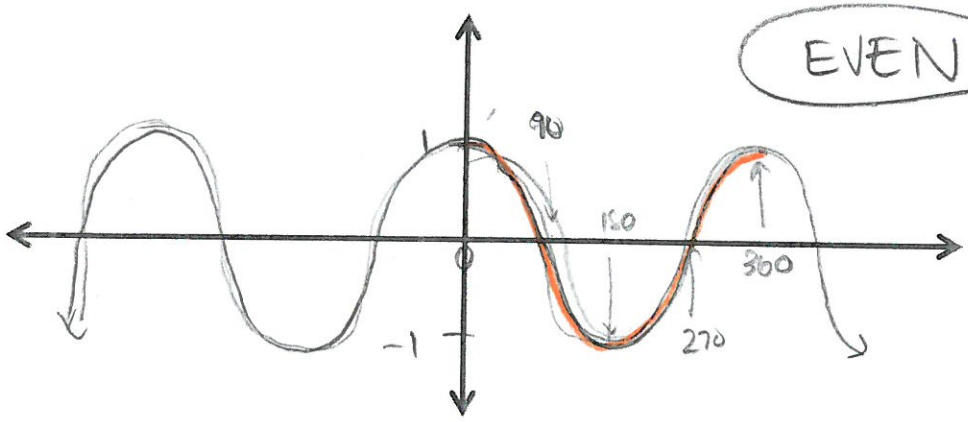
ODD

Domain: $x \in \mathbb{R}$ Natural Period 360° Amplitude: 1

Range: $y \in [-1, 1]$ Increment: $\frac{P}{4} = \frac{360}{4} = 90°$ Sinusoidal Axis: $y = 0$

The Cosine Graph





EVEN

Domain: $x \in \mathbb{R}$ Natural Period 360° Amplitude: 1

Range: $y \in [-1, 1]$ Increment: $\frac{P}{4} \quad \frac{360}{4}$ 90° Sinusoidal Axis: $y = 0$

f(x) = A sin (Bx ± C) ± D

Your mission:
Make sure your settings are in degress, the domain is –700 to 700, and your range is –10 to 10.
Set up a parent function in the first spot: (sin x or cos x)
Set up a second function in second spot, with different numbers.

f(x) = A sin (x)

What affect(s) does A have on the graph?
Vertical Stretch / compress
Reflect over x-axis

Enter: First function: y = sin x
Second function: y = 2 sin x

Play with second function: 3 sin x, 5 sin x, ½ sin x, ⅓ sin x, ...
See what happens when you make A negative. 3sinx, 5sinx, ½sin x, –4sinx, ⅓ sin x,

f(x)= sin (Bx)

What affect does B have on the graph?
Horizontal stretch / compress

Enter: First function: y = sin x
Second function: y = sin 2x

Play with second function: sin 3x, sin 5x, sin ½ x, sin ⅓ x, ...

f(x) = sin (x) ± D

What affect does D have on the graph?
shift up / down

Enter: First function: y = sin (x)
Second function: y = sin (x) + 2

Play with second function: sin (x) + 3, sin (x) – 1, sin (x) – ½

f(x) = sin (x + c)

What affect does C have on the graph?
shift left / right

Enter: First function: y = sin (x)
Second function: y = sin (x + 30)

Play with second function: sin (x + 45), sin (x – 90), sin (x +360), sin (x – 20), ...

Recall Even/Odd Functions:

As we graph these, keep in mind
Even/Odd – ness.

EVEN:
~~Oppositivein put~~ = same output
"opposite input"
PDD
Opposite input = opposite output

EVEN

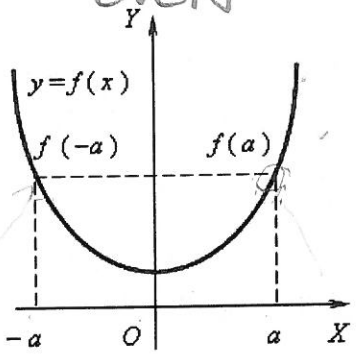


Fig. 5

If $f(x)=x^2+1$
$f(3)=10$
$f(-3)=-10$

ODD

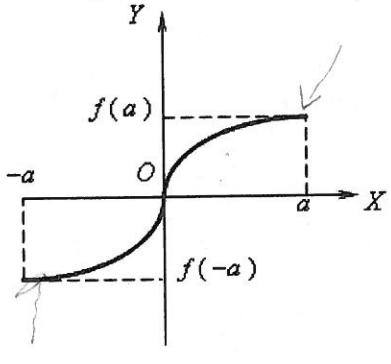
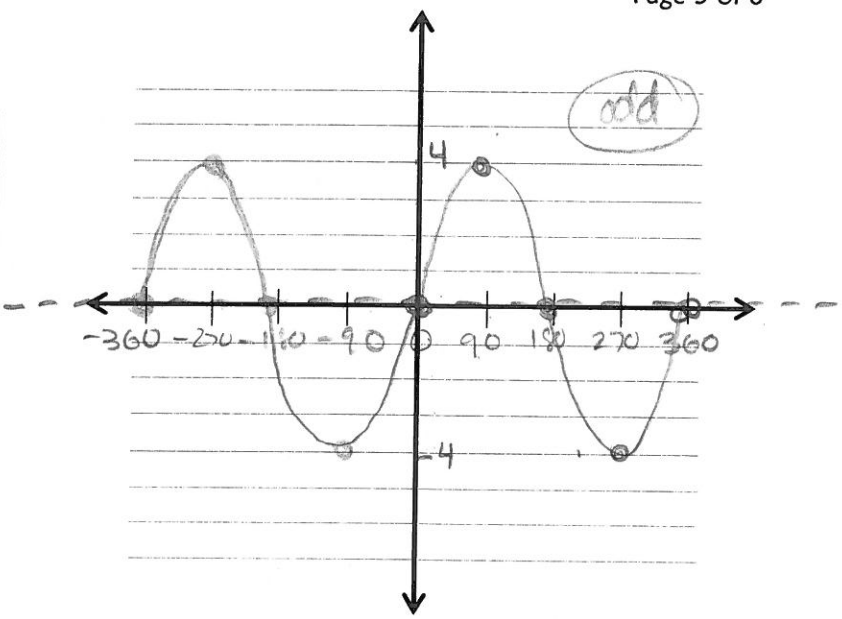


Fig. 6

If $f(x)=\sqrt[3]{x}$
$f(8)=2$
$f(-8)=-2$

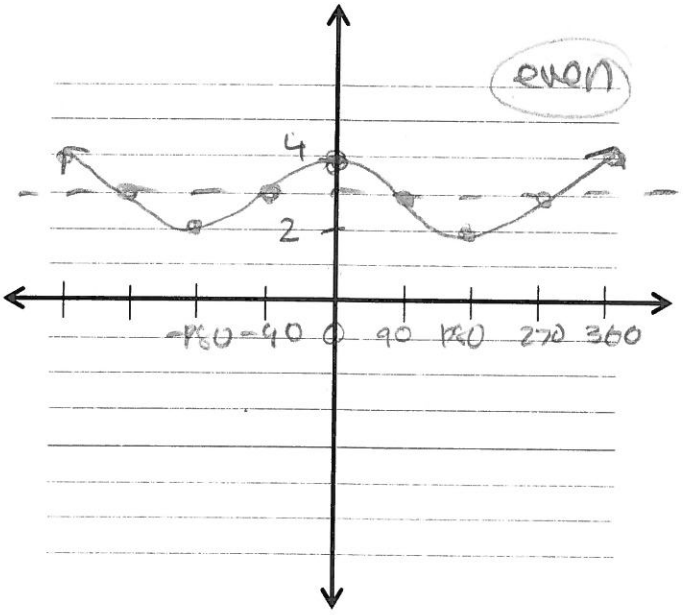
1. $y = 4\sin(x)$

A	4	SA	$y=0$
D	$x \in \mathbb{R}$		
R	$y \in [-4,4]$		
P	$360°$		
I	$P/4 = 360/4 = 90°$		



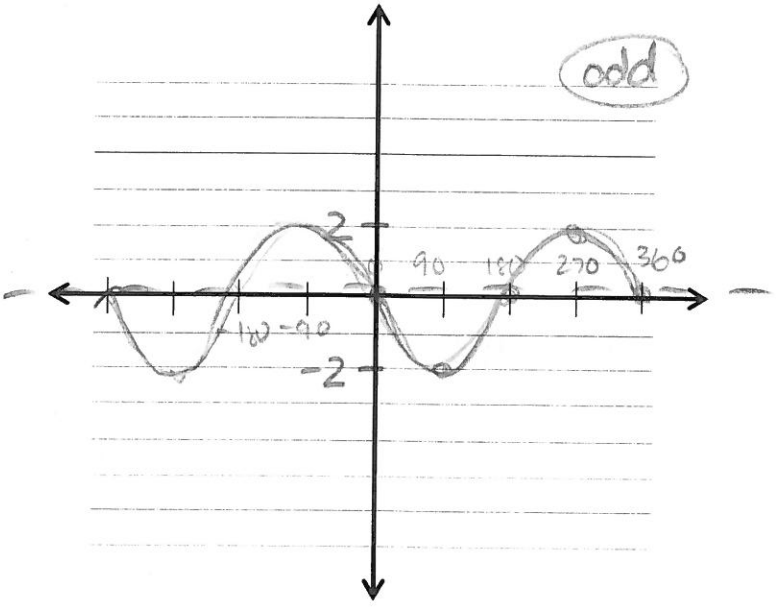
2. $y = \cos(x) + 3$

A	1	SA	$y=3$
D	$x \in \mathbb{R}$		
R	$y \in [2,4]$		
P	$360°$		
I	$90°$		



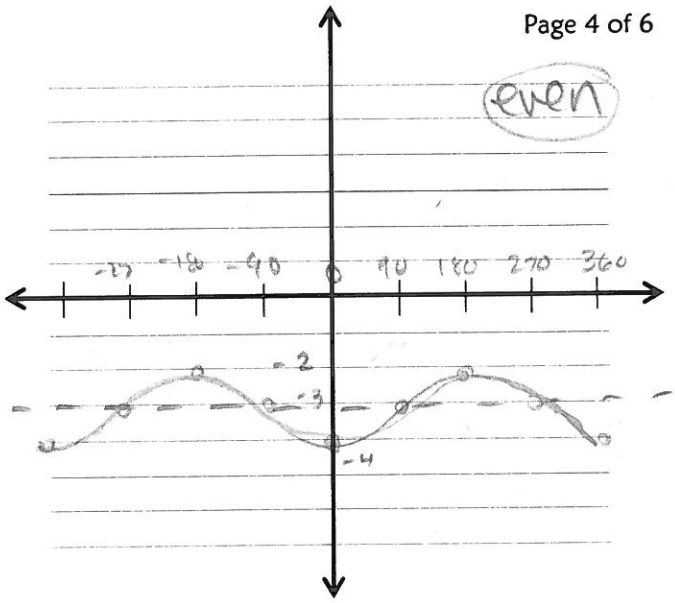
3. $y = -2\sin(x)$

A	2	SA	$y=0$
D	$x \in \mathbb{R}$		
R	$y \in [-2,2]$		
P	$360°$		
I	$90°$		



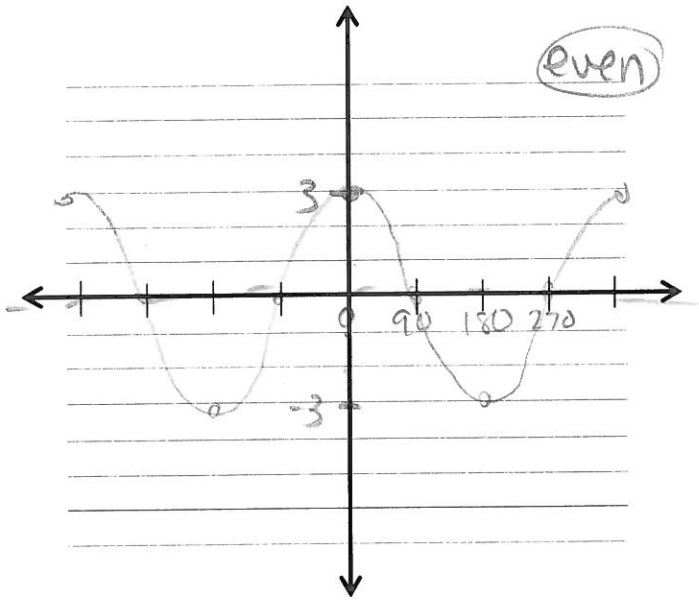
4. $y = -\cos(x) - 3$

A	1	SA	$y = -3$
D	$x \in \mathbb{R}$		
R	$y \in [-4, -2]$		
P	$360°$		
I	$90°$		



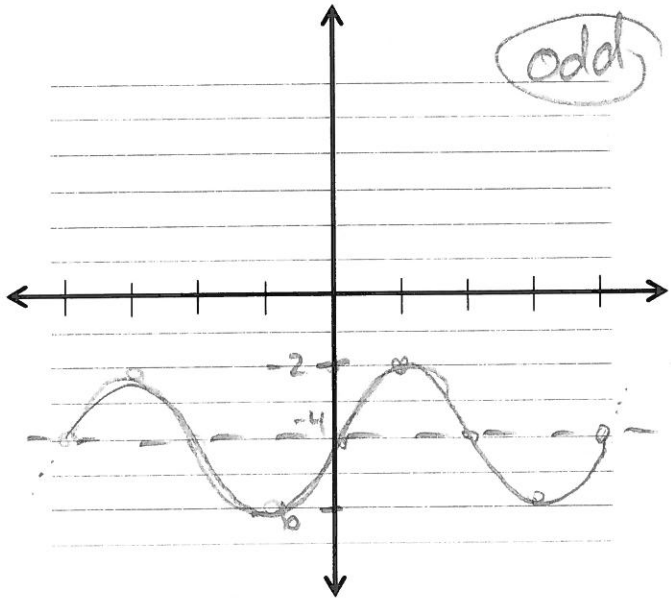
5. $y = 3\cos(x)$

A	3	SA	$y = 0$
D	$x \in \mathbb{R}$		
R	$y \in [-3, 3]$		
P	$360°$		
I	$90°$		



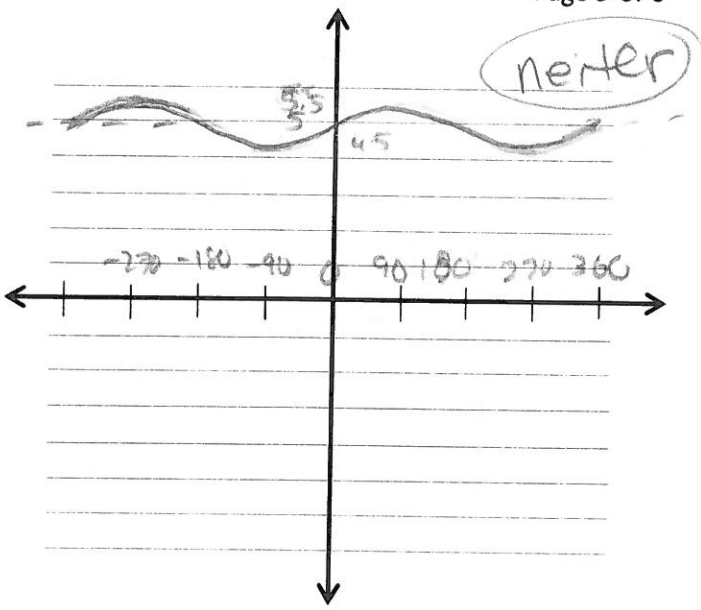
6. $y = 2\sin(x) - 4$

A	2	SA	$y = -4$
D	$x \in \mathbb{R}$		
R	$y \in [-6, -2]$		
P	$360°$		
I	$90°$		



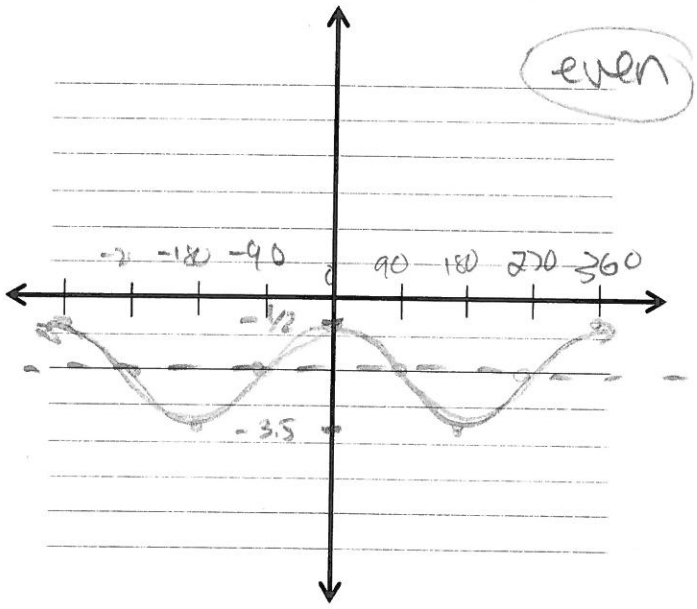
7. $y = \frac{1}{2}\sin(x) + 5$

A	1/2	SA	y=5
D	$x \in \mathbb{R}$		
R	$y \in [4.5, 5.5]$		
P	360°		
I	90°		



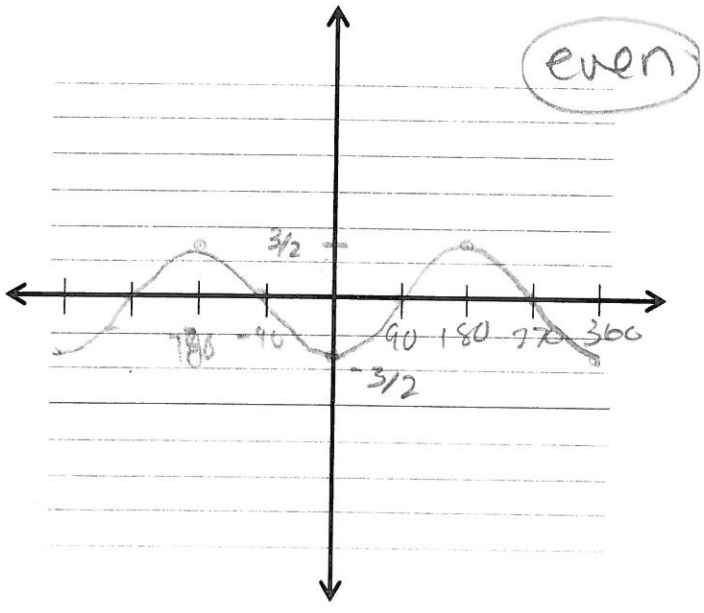
8. $y = \frac{3}{2}\cos(x) - 2$

A	3/2	SA	y=-2
D	$x \in \mathbb{R}$		
R	$y \in [-3.5, -.5]$		
P	360°		
I	90°		



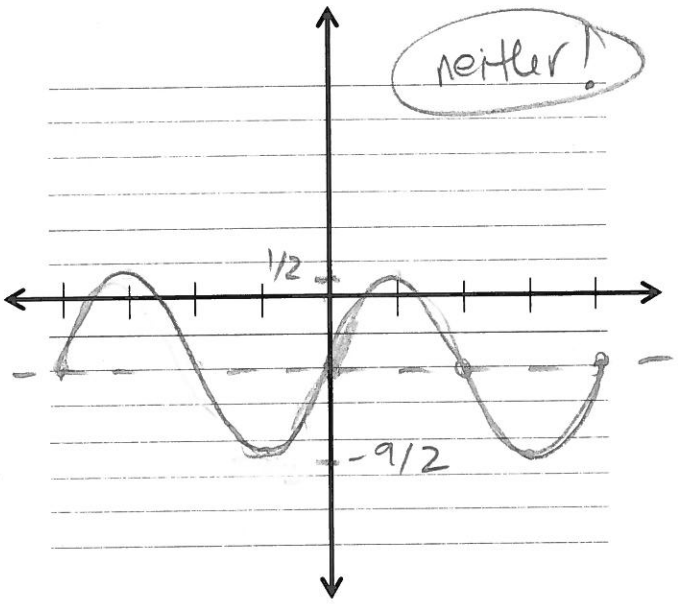
9. $y = -\frac{3}{2}\cos(x)$

A	3/2	SA	y=0
D	$x \in \mathbb{R}$		
R	$y \in [-3/2, 3/2]$		
~~B~~			
P	360°		
I	90°		



10. $y = \frac{7}{2}\sin(x) - 2$

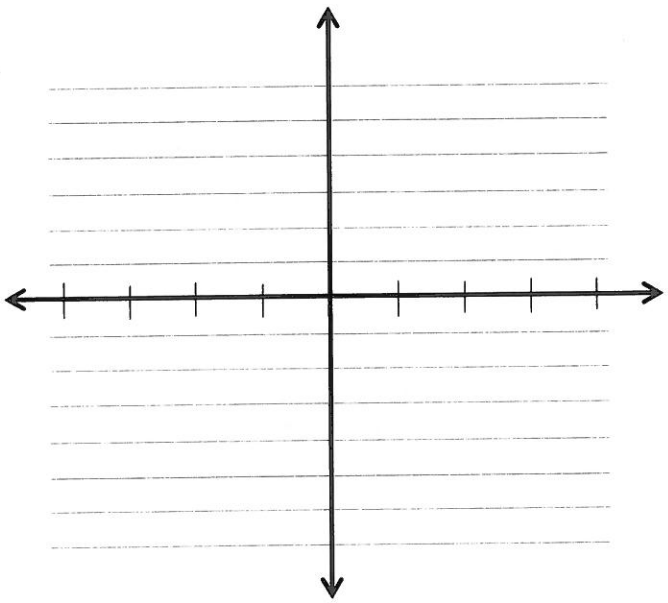
A	7/2	SA	$y = -2$
D	$x \in \mathbb{R}$		
R	$y \in [-9/2, 1/2]$		
P	360°		
I	90°		



✱ In class!

11. $y = 3\sec(x)$

A		SA	
D			
R			
P			
I			



✱ In class!

12. $y = -\csc(x) + 2$

A		SA	
D			
R			
P			
I