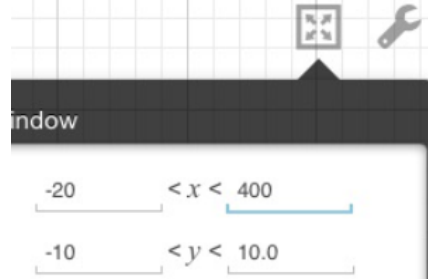


# Exploring Transformations of Sinusoidal Functions

1. Open Desmos, delete any previously existing functions.
2. Set your view:



3. Add your function:  $f(x) = a \sin(k(x - d)) + c$
4. Turn on all sliders. Set sliders as follows

a: $-10 \leq a \leq 10$	step: 0.25
k: $-5 \leq k \leq 5$	step: 0.25
d: $-180 \leq d \leq 180$	step: 15
c: $-10 \leq c \leq 10$	step: 1
5. Set each slider to its default value ( $a = 1, k = 1, d = 0, c = 0$ )
6. Explain why you think I chose the step value for each parameter.

7. Press play on the a parameter. Explain the effect that changing a has on  $\sin x$ . Be specific.

Explain what changing a from positive to negative does to  $\sin x$ .

8. Reset  $a$  to 1. Press play on the  $k$  parameter.  
Explain the effect that changing  $k$  has on  $\sin x$ . Be specific.

Explain what changing  $k$  from positive to negative does to  $\sin x$ .

9. Reset  $k$  to 1. Press play on the  $d$  parameter.  
Explain the effect that changing  $d$  has on  $\sin x$ . Be specific.

10. Reset  $d$  to 0. Press play on the  $c$  parameter.  
Explain the effect that changing  $c$  has on  $\sin x$ . Be specific.

11. Explain, in words, how you would go about graphing  $y = -2 \sin(-3(x + 4)) - 5$ .