Investigation on Sine functions

Objective: In this investigation we will examine the features of sine function with its transformation.

Use of Graphing calculator is required for this activity (Casio cg20 or Casio cg50 is recommended)

1. Sketch the following curves for $f(x) = asinx$ using your GDC and fill the table that follow.
   a. $y_1 = \sin x$
   b. $y_2 = 2\sin x$
   c. $y_3 = 0.5\sin x$
   d. $y_4 = -\sin x$
   e. $y_5 = -2\sin x$

a	$f(x)$	Maximum value	Minimum value	Amplitude = $\frac{\max - min}{2}$	Period
1	$\sin x$				
2	$2\sin x$				
0.5	$0.5\sin x$				
-1	$-\sin x$				
-2	$-2\sin x$				

What is the effect of a in $f(x) = a\sin x$?

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2. Sketch the following curves for $f(x) = sinbx$ using your GDC and fill the table that follow.
   a. $y_1 = \sin x$
   b. $y_2 = \sin 2x$
   c. $y_3 = \sin 0.5x$
   d. $y_4 = \sin 0.25x$

b	$f(x)$	Maximum value	Minimum value	Amplitude = $\frac{\max - min}{2}$	Period
1	$\sin x$				
2	$\sin 2x$				
0.5	$\sin 0.5x$				

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0.25	$\sin 0.25x$				

What is the effect of b in $f(x) = \sin bx$?

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3. Sketch the following curves for $f(x) = \sin(x - c)$ using your GDC and fill the table that follow.
   a. $y_1 = \sin x$
   b. $y_2 = \sin(x - 1)$
   c. $y_3 = \sin(x + 1)$
   d. $y_4 = \sin(x - \frac{\pi}{2})$

c	$f(x)$	Maximum value	Minimum value	Amplitude = $\frac{max - min}{2}$	Period
0	$\sin x$				
1	$\sin(x - 1)$				
-1	$\sin(x + 1)$				
$\frac{\pi}{2}$	$\sin(x - \frac{\pi}{2})$				

What is the effect of c in $f(x) = \sin(x - c)$?

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4. Sketch the following curves for $f(x) = sinx + d$ using your GDC and fill the table that follow.

   a. $y_1 = \sin x$
   b. $y_2 = \sin x + 1$
   c. $y_3 = \sin x + 2$
   d. $y_4 = \sin x - 2$

b	$f(x)$	Maximum value	Minimum value	Amplitude = $\frac{max - min}{2}$	Period
1	$\sin x$				
2	$\sin x + 1$				
0.5	$\sin x + 2$				
0.25	$\sin x - 2$				

What is the effect of d in $f(x) = \sin x + d$?

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Summarize your findings about a, b, c and d in $f(x) = \text{asin}(bx - c) + d$

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