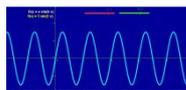


## Student activity on graphs of $y = a \sin bx$



Use in connection with the following file  $f(x) = a \sin bx$  (angle measure in radians) on the Student's CD.

1. Drag the sliders so that  $a=1$  and  $b=1$ .

Write down the period and range of  $f(x) = \sin x$

- (i) Period =
- (ii) Range =

2. Drag **slider a** to vary the value of  $a$ . What is the effect of changing variable  $a$  on the function  $f(x) = a \sin bx$ ?

3. Drag the **slider a** to vary the value of  $a$ , keeping  $b=1$  and fill in the following table.

$a$	1	2	3	4
Range of $f(x)$				

4. Drag the **slider a** to vary the value of  $a$ , keeping  $b=1$  and fill in the following table.

$a$	-1	-2	-3	-4
Range of $f(x)$				

You may wish to check your answer to Q2 having answered Q3 and Q4.

5. Drag the **slider b** to vary the value of  $b$ , keeping  $a$  constant. What is the effect of varying  $b$  on the function  $f(x) = a \sin bx$ ?

6. Drag the **slider b** to vary the value of  $b$ , keeping  $a$  constant at e.g.  $a=2$  and fill in the following table.

$b$	1	2	3	4
Period of $f(x)$				

7. Drag the **slider b** to vary the value of  $b$ , keeping  $a$  constant at e.g.  $a=2$  and fill in the following table.

$b$	-1	-2	-3	-4
Period of $f(x)$				

8. Fill in the table below:

Function	Range	Period
$y = 3 \sin x$		
$y = \sin 4x$		
$y = 5 \sin 3x$		
$y = 2 \sin 2x$		

9. Given that  $y = a \sin bx$ , write down the range and period of this function in terms of  $a$  and  $b$ .

Range =

Period =

10. Fill in the last column in the table below, in the form  $y = a \sin bx$ , for  $a$  and  $b$ , given the range and period of each function

Range	Period	$y = a \sin bx$
$[-1, 1]$	$\pi$	
$[-3, 3]$	$\frac{2\pi}{3}$	
$[-5, 5]$	$\frac{\pi}{2}$	
$[-4, 4]$	$\frac{\pi}{4}$	

11. Given that the period of  $f(x) = a \sin bx$  is  $\pi$  radians and the range is  $[-2, 2]$  sketch a graph of the function on the graph paper provided below for the domain  $0 \leq x \leq 4\pi$

