

Translating Functions

Level 1 – 2

1. If $f(x) = x^2$ complete the following tables and plot the graphs.
Don't forget to label each graph.

$y = f(x)$	
x	y
-2	
-1	
0	
1	
2	

$y = f(x-2)$	
x	y
0	
1	
2	
3	
4	

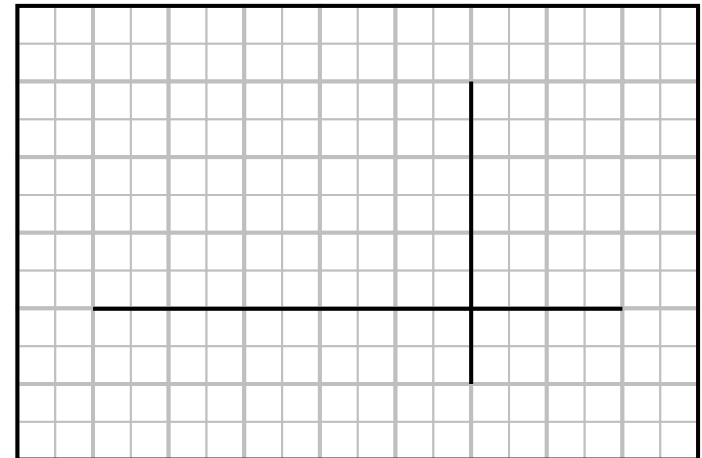
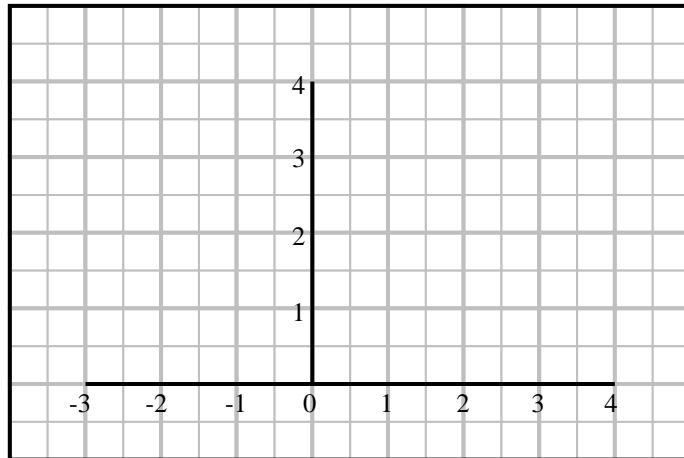
$y = f(x+1)$	
x	y
-3	
-2	
-1	
0	
1	

2. If $f(x) = x^2 + 2x$ complete the following tables and plot the graphs.
Don't forget to label each graph.

$y = f(x)$	
x	y
-3	
-2	
-1	
0	
1	

$y = f(x+2)$	
x	y
-5	
-4	
-3	
-2	
-1	

$y = f(x-1)$	
x	y
-2	
-1	
0	
1	
2	



3. If $f(x) = -x^2$ complete the following tables and plot the graphs.
Don't forget to label each graph.

$y = f(x)$	
x	y
-2	
-1	
0	
1	
2	

$y = f(x)+1$	
x	y
-2	
-1	
0	
1	
2	

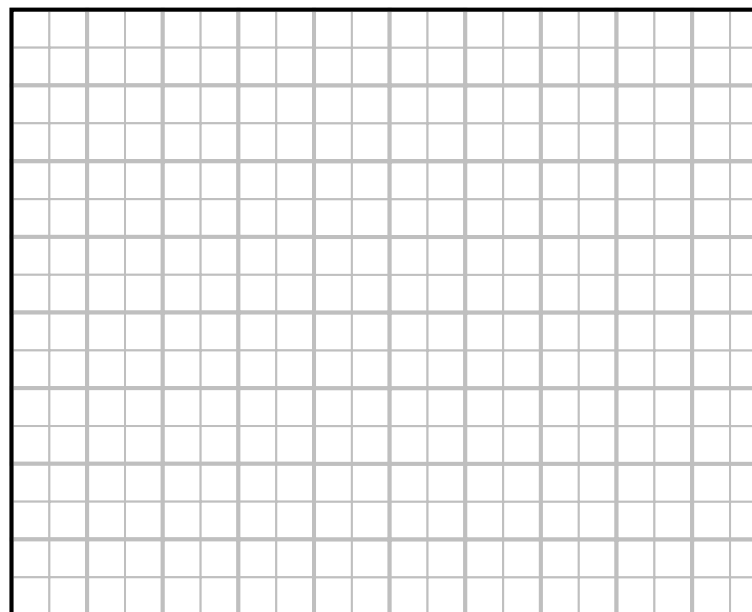
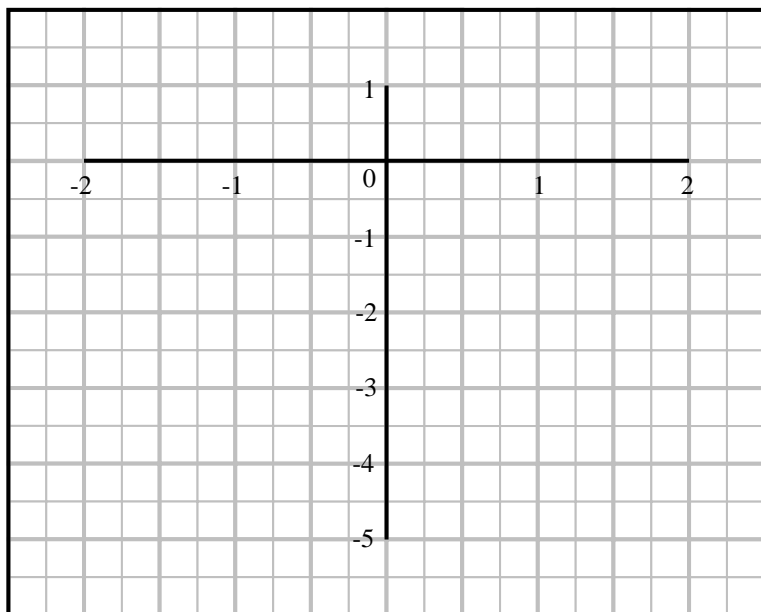
$y = f(x)-1$	
x	y
-2	
-1	
0	
1	
2	

4. If $f(x) = 2x^2$ complete the following tables and plot the graphs.
Don't forget to label each graph.

$y = f(x)$	
x	y
-2	
-1	
0	
1	
2	

$y = f(x)-4$	
x	y
-2	
-1	
0	
1	
2	

$y = f(x)+2$	
x	y
-2	
-1	
0	
1	
2	



5. Complete the following sentences by using every word once from the following list

by units vertically translated 'a' by units horizontally 'b' translated

a) The graph of $y = f(x - a)$ is the graph of $y = f(x)$

b) The graph of $y = f(x) + b$ is the graph of $y = f(x)$

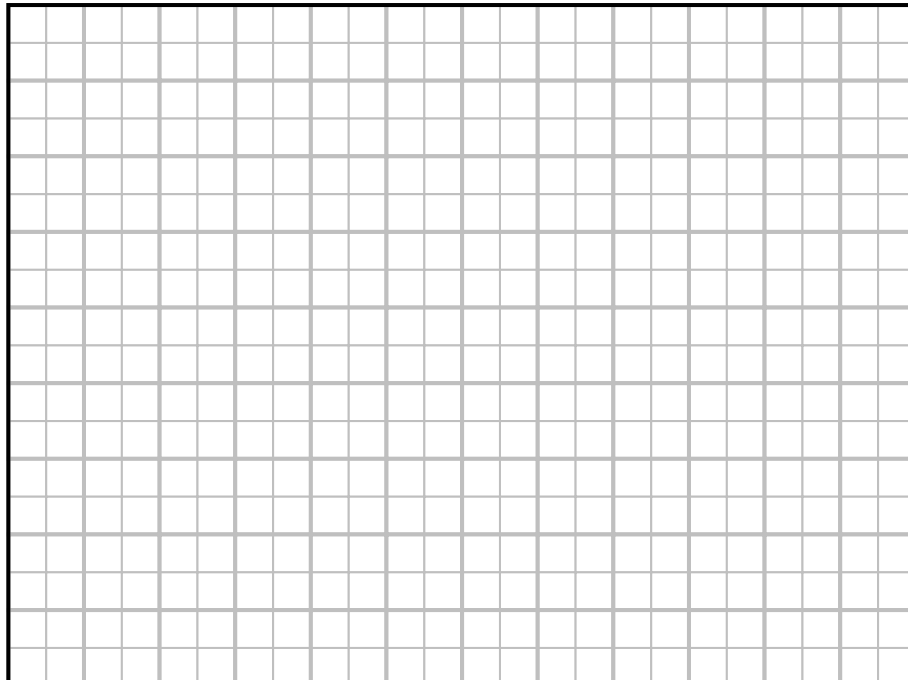
6. If $f(x) = x^2$ complete the following tables and plot the graphs. Don't forget to label each graph.

$y = f(x - 1) + 2$	
x	y
-1	
0	
1	
2	
3	

$y = f(x + 3) + 4$	
x	y
-5	
-4	
-3	
-2	
-1	

$y = f(x - 2) + 3$	
x	y
0	
1	
2	
3	
4	

$y = f(x + 2) - 3$	
x	y
-4	
-3	
-2	
-1	
0	



7. Complete the following sentence:

The graph of $y = f(x - a) + b$ is the graph of $y = f(x)$

.....

Level 5 – 6

8. The parabola $y = x^2$ is translated 3 units to the right, followed by 4 units upwards. Find the equation of the new parabola in expanded form.

.....

.....

.....

9. The parabola $y = x^2$ is translated 2 units to the left, followed by 3 units upwards. Find the equation of the new parabola in expanded form.

.....

.....

.....

10. The parabola $y = x^2 + x$ is translated 1 unit to the left, followed by 2 units downwards. Find the equation of the new parabola in expanded form.

.....

.....

.....

11. If $f(x) = x^2$:

a) Determine the function $f(x - 1)$

.....

b) Hence explain how the graph of $y = x^2 - 2x + 1$ compares to the graph of $y = x^2$.

.....

.....

12. If $f(x) = x^2$

a) Write $x^2 + 4x + 4$ in terms of $f(x)$. *Hint: first factorise the equation*

.....

b) Hence describe how the graph of $y = x^2 + 4x + 4$ compares to the graph of $y = x^2$.

.....

.....

13. Describe how the graph of $y = x^2 - 6x + 9$ compares to the graph of $y = x^2$. Use the same method as the previous question.

.....

.....

.....

14. Describe how the graph of $y = 3x^2 + 7$ compares to the graph of $y = 3x^2$.

.....

.....

.....

15. Describe how the graph of $y = 2x^2 - 3$ compares to the graph of $y = 2x^2$.

.....

.....

.....

16. Describe how the graph of $y = x^2 - 2x + 3$ compares to the graph of $y = x^2$.

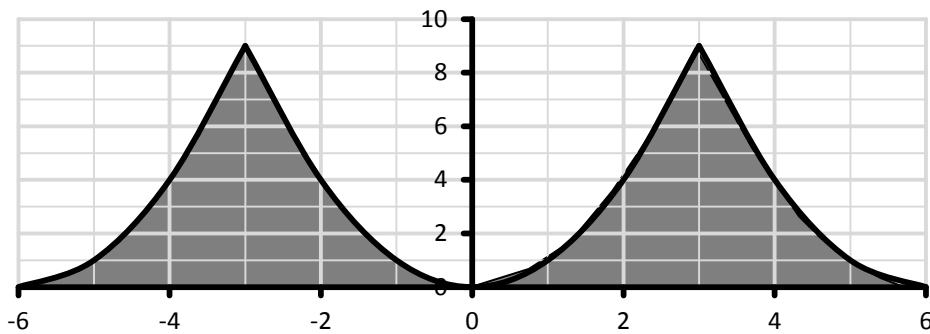
.....

.....

.....

.....

17. A manufacturer designs and creates costume parts. The following cat ears can be described using only quadratic equations. Determine these equations.



.....

.....

.....

.....

18. Describe how the graph of $y = x^2 - 4x + 5$ compares to the graph of $y = x^2 + 6x + 8$.

.....

.....

.....

.....

.....

19. Describe how the graph of $y = 2x^2 - 8x + 10$ compares to the graph of $y = 2x^2 + 12x + 8$.

.....

.....

.....

.....

.....