highermathematics.co.uk

Transformations of Graphs

Shifts For c>0, *to obtain the graph of:*		
f(x)+c	*shift the graph of f(x)*	**upward** c units
f(x)-c	*shift the graph of f(x)*	**downward** c units
f(x+c)	*shift the graph of f(x)*	**left** c units
f(x-c)	*shift the graph of f(x)*	**right** c units

Stretches and compressions For c>1, *to obtain the graph of:*		
cf(x)	***stretch*** *the graph of f(x)*	**vertically** by a factor of c
(1/c)f(x)	***compress*** *the graph of f(x)*	**vertically** by a factor of c
f(cx)	***compress*** *the graph of f(x)*	**horizontally** by a factor of c
f(x/c)	***stretch*** *the graph of f(x)*	**horizontally** by a factor of c

Reflections *To obtain the graph of:*		
-f(x)	*reflect the graph of f(x)*	**about the x-axis**
f(-x)	*reflect the graph of f(x)*	**about the y-axis**