Functions and Graphs

To sketch a curve we need the roots, y-intercept and turning point.

1. A function is defined by $f(x) = x^2 - 2x - 8$. Sketch the graphs of:

a. $y = f(x)$ b. $y = f(x + 3)$ c. $y = f(x + 2)$ d. $y = f(x + 4)$

e. $y = f(x - 3)$ f. $y = f(x - 2)$ g. $y = f(x - 4)$

2. a. What effect does a have on the graph $y = f(x + a)$ if $a > 0$?

b. What effect does a have on the graph $y = f(x + a)$ if $a < 0$?

3. A function is defined by $f(x) = x^2 + 2x - 8$. i) Write the following in the form $y = (x + p)^2 + q$ and ii) state the turning point where:

a. $y = f(x)$ b. $y = f(x) + 3$ c. $y = f(x) + 2$ d. $y = f(x) + 4$

e. $y = f(x) - 3$ f. $y = f(x) - 2$ g. $y = f(x) - 4$

4. a. What effect does a have on the graph $y = f(x) + a$ if $a > 0$?

b. What effect does a have on the graph $y = f(x) + a$ if $a < 0$?

5. A function is defined by $f(x) = x^2 + 2x - 8$. i) Write the following in the form $y = k(x + a)(x + b)$ and ii) state the roots, iii) y-intercept iv) turning point of:

a. $y = f(x)$ b. $y = 2f(x)$ c. $y = 3f(x)$ d. $y = 4f(x)$

6. a. What effect does k have on the graph $y = kf(x)$ if $k > 0$?

b. What effect does k have on the graph $y = kf(x)$ if $k < 0$?

7. A function is defined by $f(x) = (x + 24)(x - 12)$. Find the i) roots, ii) y-intercept and iii) turning point of:

a. $y = f(x)$ b. $y = f(2x)$ c. $y = f(3x)$ d. $y = f(4x)$

8. a. What effect does k have on the graph $y = f(kx)$ if $k > 0$?

b. What effect does k have on the graph $y = f(kx)$ if $k < 0$?