REVISION: FUNCTIONS   21 APRIL 2014

Lesson Description

In this lesson revise:

- how changing the parameters of function transforms the function
- how to find the average gradient between two point on a parabola

Functions: Changing Parameters

Summary

If $g(x) = (x-p)^2 + q$

What effect does q have on the graph of g if $q > 0$? If q<0?

What effect does p have on the graph of g if p > 0? If p < 0?

If $f(x) = \dfrac{k}{x-p} + q$

What effect does q have on the graph of g if $q > 0$? If q<0?

What effect does p have on the graph of g if p > 0? If p < 0?

Improve your Skills

Question 1

Sketch the graphs on the same system of axes and discuss the effect of p:

$y = x^2; y = (x-2)^2$ and $y = (x + 2)^2$

Question 2

Sketch the graphs of on the same system of axes and discuss the effect of q:

$y = x^2 + 1; \quad y = (x-2)^2 + 1$

$y = (x + 2)^2 + 1$

Question 3

Sketch the graph of $g(x) = -2x^2 -5x + 3$ by writing it in the form $y = a(x-p)^2 + q$ first.

Question 4

Sketch the graphs on the same system of axes and discuss the effect of p and q:

$y = \dfrac{6}{x}; y = \dfrac{6}{x-2} + 1$
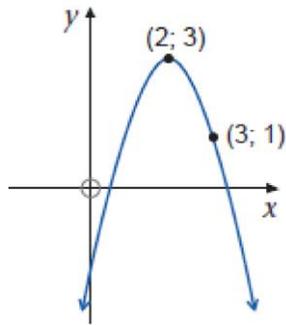
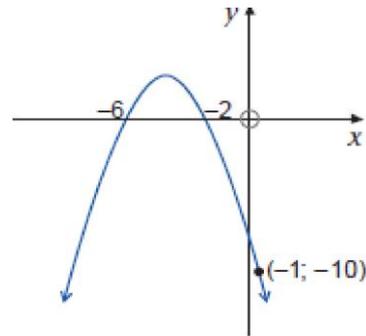## Average gradient of a function

Improve your Skills

Question 1

Find the equations of the following graphs:

a.)

b.)

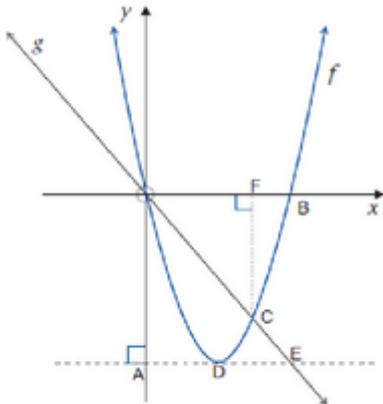### Question 2

The graphs of the following functions are given:

$Y = f(x) = 2x^2 - 12x$ and $y = g(x) = ax + q$

The two graphs intersect at O and C. D is the turning point of the parabola, and DE || x-axis. CF || y-axis with F on the x-axis.

Determine:

   a.) The coordinates of B
   b.) The coordinates of D
   c.) The coordinates of C if CF is 10 units
   d.) The values of a and q
   e.) The length of DE
   f.) The length of OC, giving your answer in simplest surd form
   g.) The area of ΔOFC
   h.) The values of x for which

   i. $f(x) \leq g(x)$

   ii. $f(x) \geq 0$

   iii. $f(x).g(x) \leq 0$

Question 3

Given the equation y = f(x) = -x2 + 9.

   a.) Determine the average gradient of the curve between the points where x = 1 and x = 5.
   b.) For which values of x is f(x)
       i.   increasing

       ii.   decreasing?