

**REVISION: FUNCTIONS**

**24 MARCH 2014**



**Lesson Description**

In this lesson we revise:

- Functions & Inverses
- Graphs of Inverses
- Exponential & Logarithmic Functions



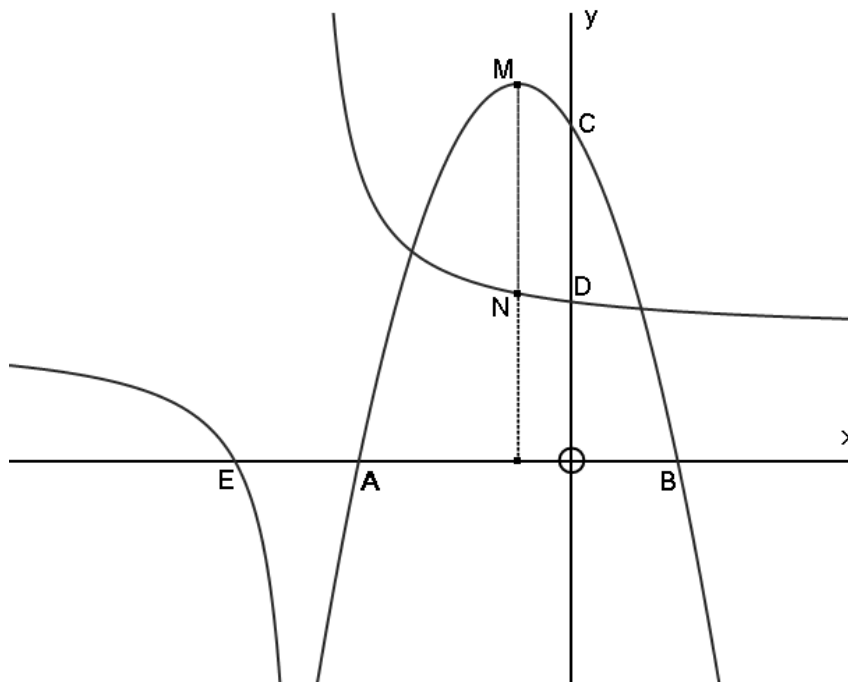
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**Functions & Inverses**

**Question 1**

The figure below represents the graphs of the following functions

$$f(x) = -2x^2 - 4x + 16 \quad \text{and} \quad g(x) = \frac{8}{x+5} + 6$$



- Determine the coordinates of A, B, C, D, E (6)
- If M is the turning point of  $f(x)$ , determine the length of MN (4)
- How many points of intersection do  $f$  and  $g$  share? (1)

## Graphs of Inverses

### Question 1

Given:  $p(x) = -3x^2$ .

- Determine the equation of the inverse of  $p$  stating its domain and range.
- Draw a sketch graph of  $p$  and the inverse of  $p$  on the say set of axes
- Why is the inverse of  $p$  not a function?
- How must the domain of  $p$  be restricted such that the inverse of  $p$  is a function?

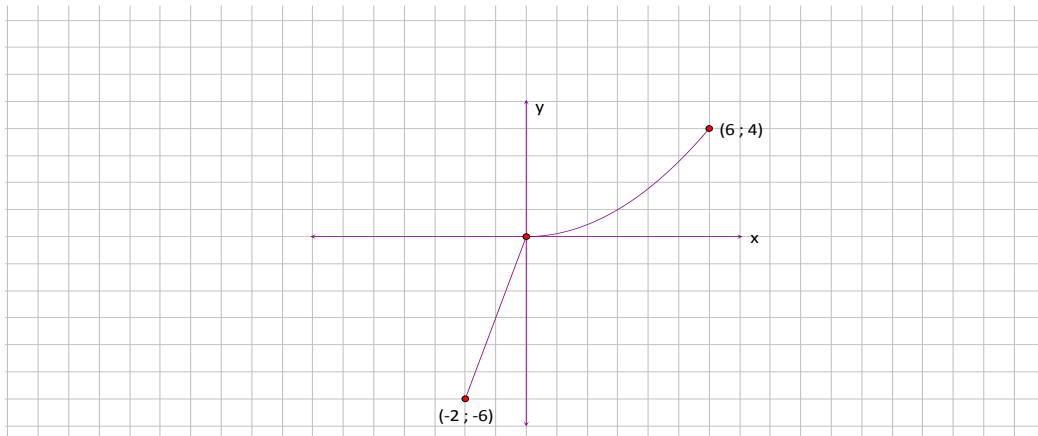
### Question 2

Given:

$$f(x) = \frac{8x+32}{20} ; g(x) = \frac{5x}{2} - 4.$$

- Calculate:  $f(1) + g(2)$
- Verify that  $g$  is the inverse of  $f$ .

### Question 3



- Give the domain and range of the above function.
- Sketch the graph of the inverse of this function.
- Explain why this inverse is a function.

## Exponential & Logarithmic Functions

### Question 2

2.1. Given:  $f(x) = 2^x - 8$ .

Determine:

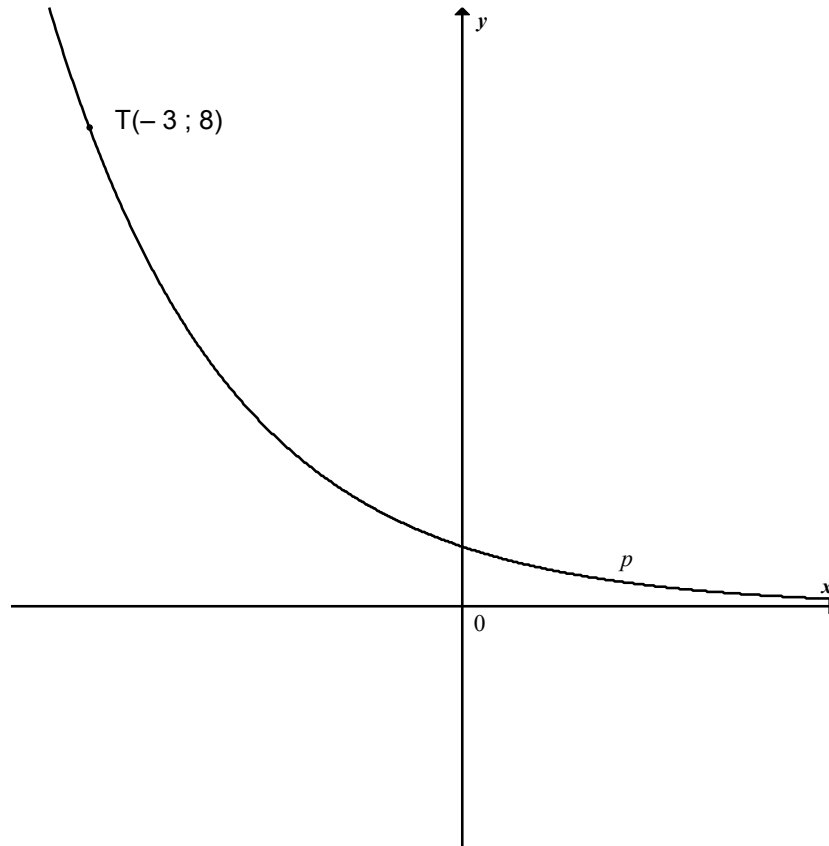
- an equation of  $h$  if  $h(x) = f(2x) + 8$
- an equation of  $h^{-1}$  in the form  $y = \dots$

2.2. Given  $f(x) = 2^x$ ,  $g(x) = f(x - 2)$ ,  $h(x) = f^{-1}(x)$ .

Write down the equations of  $g$  and  $h$  in the form  $y = \dots$

**Question 4**

The graph of  $p(x) = a^x$  is sketched below. The point  $T(-3; 8)$  lies on the graph of  $p$ .



- a.) Calculate the value of  $a$ . (3)
- b.) Write down the equation of  $p^{-1}(x)$  in the form  $y = \dots$  (2)
- c.) For which values of  $x$  will  $p^{-1}(x) > -3$ ? (2)
- d.) Write down the equation of  $q$  if  $q$  is the result of  $p$  shifted 3 units to the right. (2)