

**Mathematics Specialist**

**Test 2 2016**

**Functions**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ TEACHER: MLA**

**50 marks 50 minutes**

**SCSA formulae sheets, ClassPads and a double-sided A4 sheet of notes may be used**

**Question 1 [2 marks]**

Use an algebraic method to solve

**Question 2 [4 & 1 = 5 marks]**

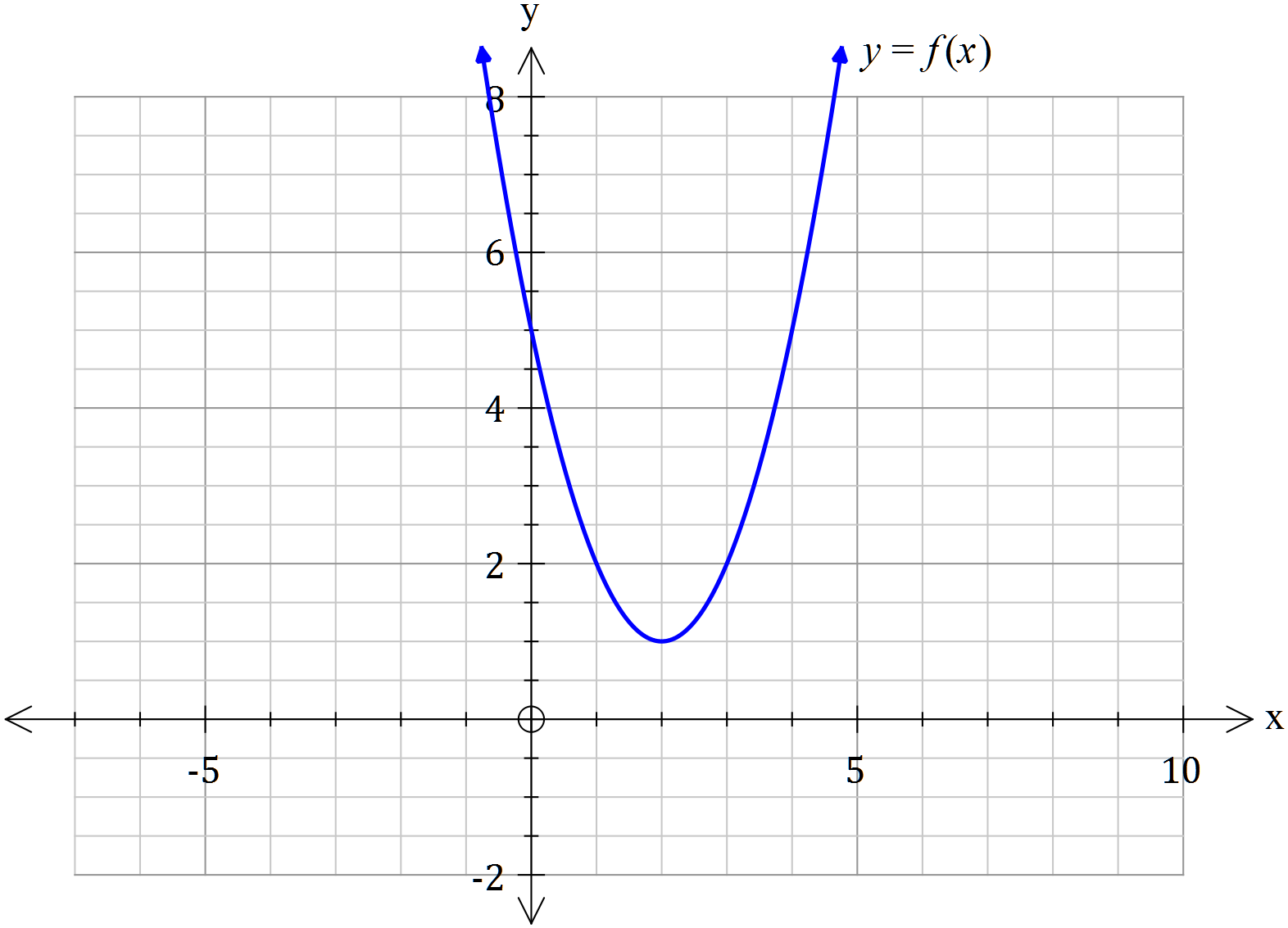
(a)

(b) Using your ClassPad, or otherwise, solve

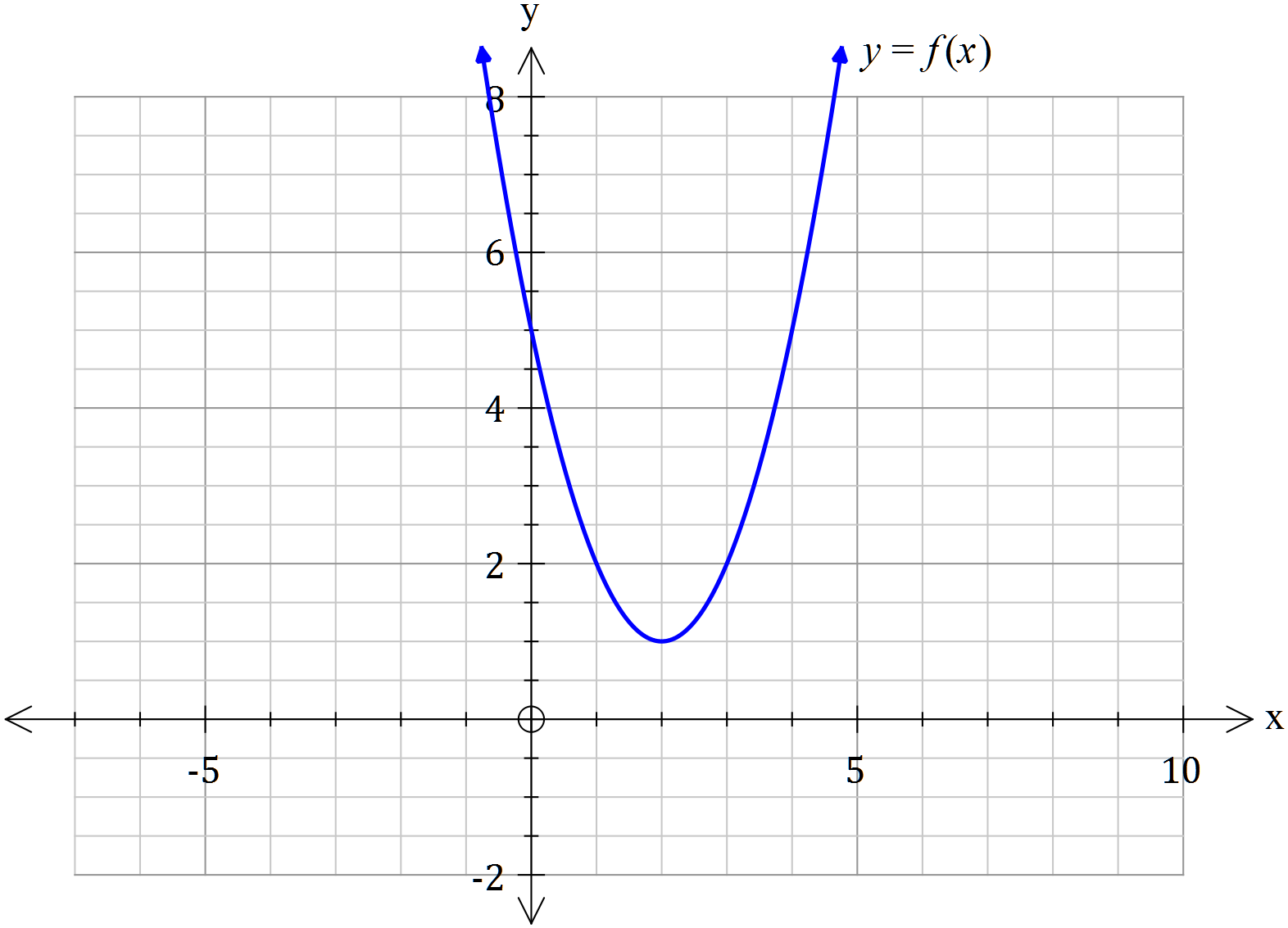
**Question 3 [3 & 3 = 6 marks]**

On the axes provided, sketch the following functions:

(a)



(b)

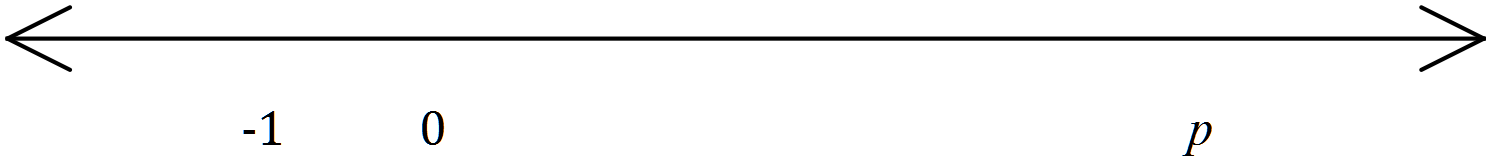


**Question 4 [3 marks]**

If and find its domain and range.

**Question 5 [3 marks]**

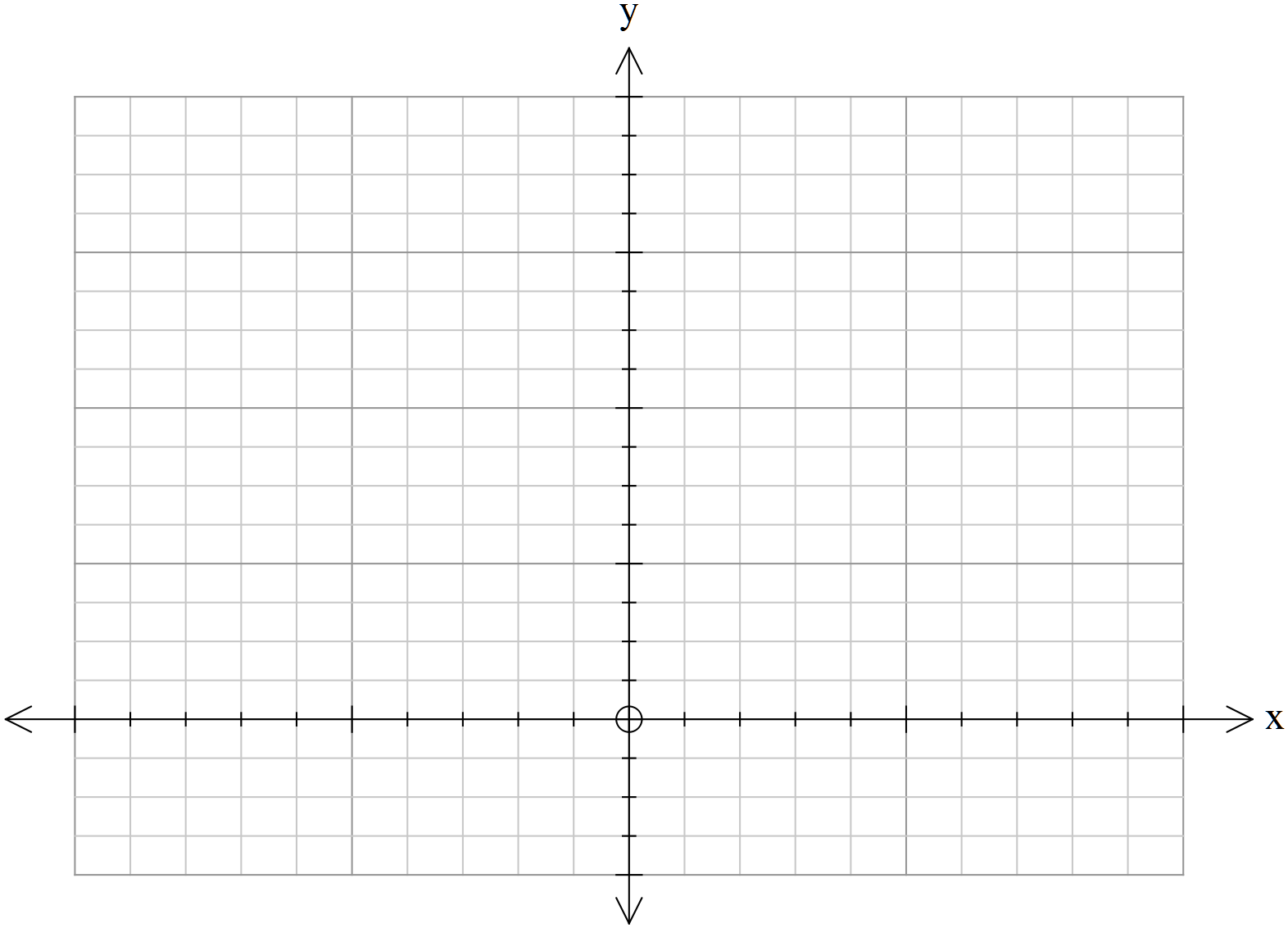
With reference to the number line drawn below, determine the appropriate inequality symbol for



**Question 6 [3 & 3 = 6 marks]**

(a) Sketch the graphs of

Be sure to label each graph and to identify all intercepts



(b) Hence, determine the value(s) of x for which

**Question 7 [3 marks]**

Consider

:

* root (zero) at
* intercept at

Find the values of.

**Question 8 [3 & 5 = 8 marks]**

(a) Express in piecewise form.

(b) (i) Express as a piecewise function.

(ii)

State the equation used to obtain this solution.

**Question 9 [1, 2, 1, 1, 1 & 1 = 7 marks]**

Consider , where

(a) Find

(b) Use your answers in (a) to show that does not have an inverse function

(c) Determine the largest possible domain for, consisting only of positive numbers, so that has an inverse function

(d) State the range for that corresponds with your domain in (c)

(e) Using your ClassPad, or otherwise, determine the rule for the inverse of that corresponds with your domain in (c)

(f) State the domain and range for

**Question 10 [5, 2 = 7 marks]**

Consider

(a) Using your ClassPad, or otherwise, determine the following:

(i) Stationary points

(ii) Intercept(s)

(iii) Asymptotes

(b) Investigate the behaviour of as

End of Test 2