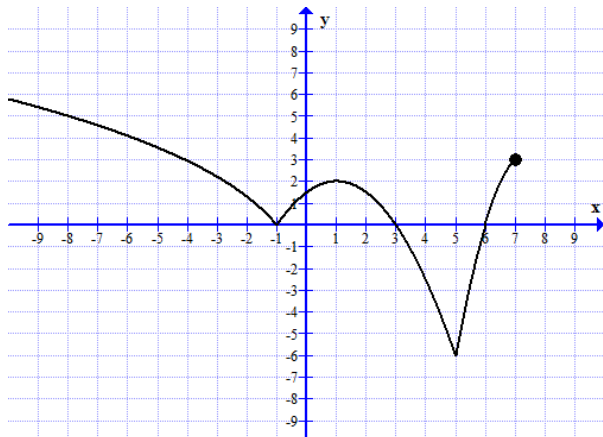


**MAC 1140**  
**LA session**

Week 6

1. The graph of a function  $f$  is given below.



Use the graph above to solve the following inequalities.

- a)  $f(x) > 0$
- b)  $f(x) \leq 0$

2. Sketch the graph of the function  $f(x) = -3x^2(x+3)(x-2)^5(x^2+1)$  and use it to solve the inequality

$$-3x^2(x+3)(x-2)^5(x^2+1) \leq 0$$

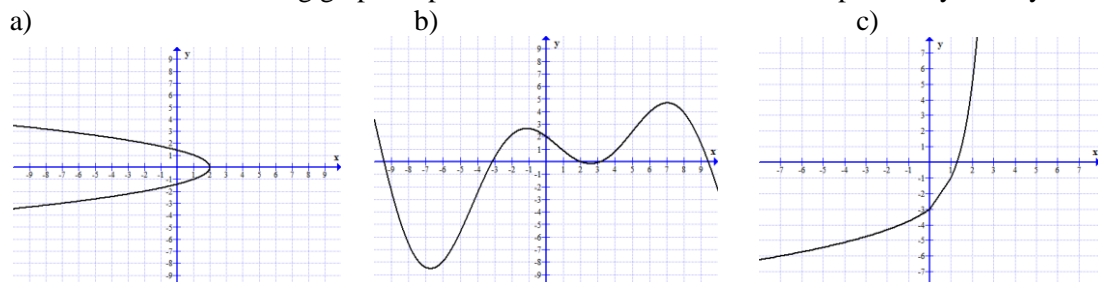
3. Use algebraic methods to solve the following inequalities

- a)  $x^5 \geq x^3$
- b)  $2x^2 - 7x - 4 < 0$
- c)  $x^4 + x^3 - x^2 > 0$
- d)  $\frac{x-3}{2x^2-50} \leq 0$
- e)  $\frac{2x+1}{x-3} > 1$
- f)  $\frac{x-1}{x+2} < \frac{x}{x-1}$

4. Find the domain of the following functions

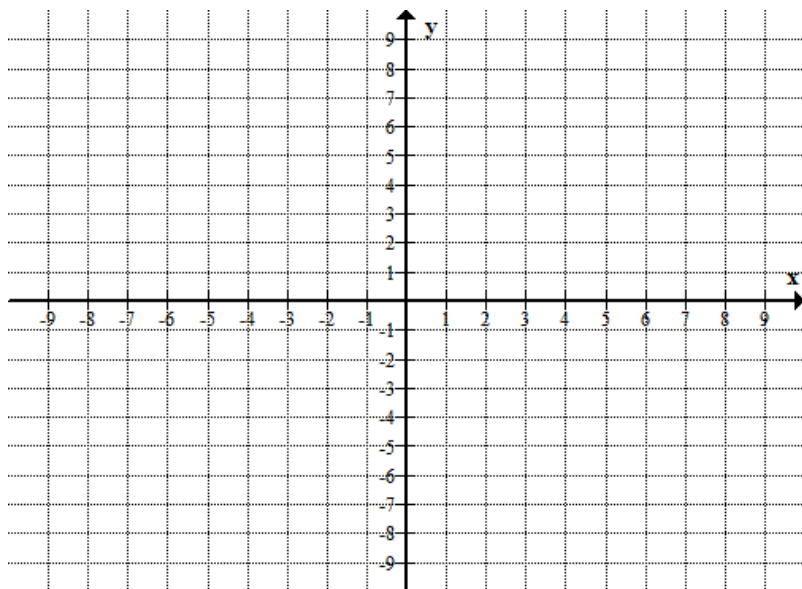
- a)  $f(x) = \sqrt{\frac{x^2-1}{2x+5}}$
- b)  $f(x) = \sqrt{x^3 - 2x^2 - 8x}$

5. Which of the following graphs represents a one-to-one function? Explain why or why not.

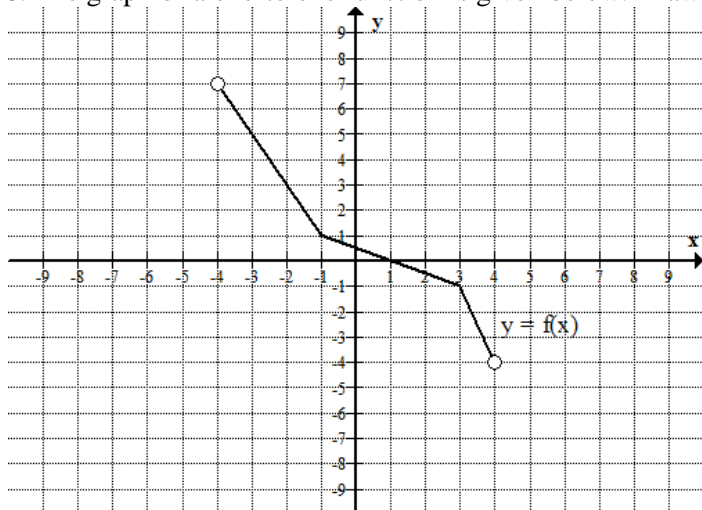


6. Check whether the functions  $f(x) = \frac{3x+1}{x-2}$  and  $g(x) = \frac{x-2}{3x+1}$  are inverses of each other.

7. Sketch the graph of  $f(x) = x^3 + 1$  and determine whether it is one to one. If it is, find its inverse and sketch its graph. Find the domain and range of both,  $f$  and  $f^{-1}$ .



8. The graph of a one-to-one function is given below. Draw, in the same coordinate system, the graph of its inverse.



9. Find the inverse of the following one-to-one functions

a)  $f(x) = \frac{3x+1}{x-2}$

b)  $f(x) = x^2 - 4, x \geq 0$

10. Points (1, 3), (2,4), (3,5) are on the graph of a one-to-one function  $f$ . What is  $f(1)$ ? What is  $f^{-1}(3)$ ?