

Math 121 HW #4

Due: Mar. 9

Chapter 10.3

Prove that the following functions are continuous at the given points:

2.
$$F(x) = \frac{x-3}{5x}; x = -3$$

5.
$$h(x) = \frac{x-4}{x+4}; x = 4$$

Determine if the function is continuous at the given points:

9.
$$g(x) = \frac{x-3}{x^2-9}; x = 3, -3$$

10.
$$h(x) = \frac{3}{x^2+4}; x = 2, -2$$

Find all the points of discontinuity:

19.
$$f(x) = \frac{3}{x+4}$$

20.
$$f(x) = \frac{x^2+3x-4}{x^2-4}$$

22.
$$f(x) = -1$$

23.
$$f(x) = \frac{x^2+6x+9}{x^2+2x-15}$$

26.
$$f(x) = \frac{2x-3}{3-2x}$$

29.
$$f(x) = \begin{cases} 1 & x \geq 0 \\ -1 & x < 0 \end{cases}$$

31.
$$f(x) = \begin{cases} 0 & x \leq 1 \\ x-1 & x > 1 \end{cases}$$

32.
$$f(x) = \begin{cases} x-3 & x > 2 \\ 3-2x & x < 2 \end{cases}$$

Chapter 10.4

Solve the following inequalities

1.
$$x^2 - 3x - 4 > 0$$

2.
$$x^2 - 8x + 15 > 0$$

6.
$$x^2 - 4 < 0$$

9.
$$(x+2)(x-3)(x+6) \leq 0$$

12.
$$(x+2)^2 > 0$$

17.
$$\frac{x}{x^2-9} < 0$$

20.
$$\frac{3}{x^2-5x+6} > 0$$

24.
$$\frac{2x+1}{x^2} \leq 0$$

25.
$$x^2 + 2x \geq 2$$