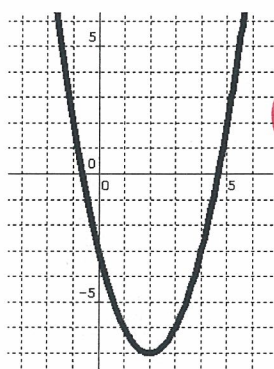


# Continuity Practice II.doc

Name: \_\_\_\_\_

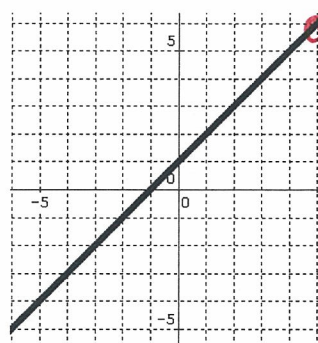
Below are some functions with their graphs. Determine whether the functions have any discontinuities within the interval shown. If so, where are the discontinuities and what type of discontinuities are they?

1)  $g(x) = x^2 - 4x - 3$



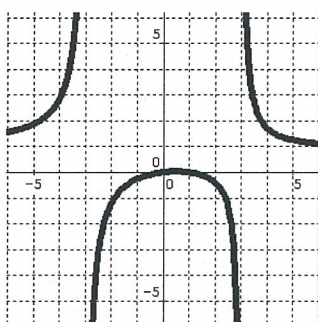
*Continuous*

2)  $h(x) = \frac{x^2 - 4x - 5}{x - 5}$



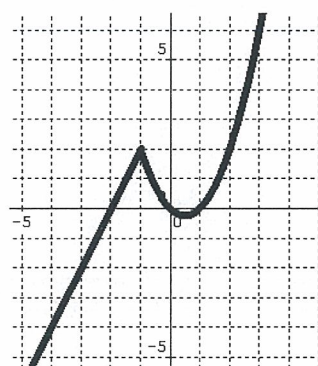
*Removable at x=5*

3)  $j(x) = \frac{x^2 - x}{x^2 - 9}$



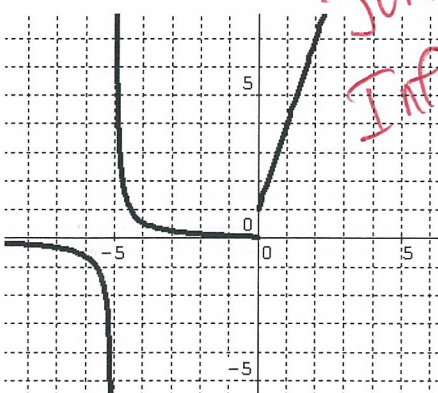
*Infinite at x=3 and x=-3*

4)  $k(x) = \begin{cases} 2x + 4, & x \leq -1 \\ x^2 - x, & x > -1 \end{cases}$



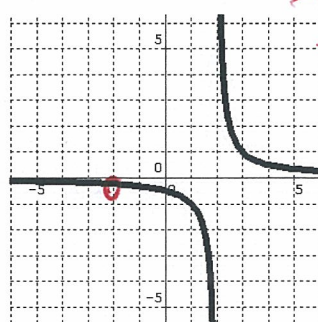
*Continuous*

5)  $m(x) = \begin{cases} \frac{x-1}{x^2-25}, & x < 0 \\ 3x+1, & x \geq 0 \end{cases}$



*Jump at x=0  
Infinite at x=-5*

6)  $f(x) = \frac{x+2}{x^2-4}$



*Removable at x=-2  
Infinite at x=2*

Determine algebraically whether the following functions are continuous. If not, explain why and indicate any points where the functions are NOT continuous.

$$7) f(x) = \frac{x^2 + 2x}{x}$$

$$\frac{\cancel{x}(x+2)}{\cancel{x}}$$

Removable at  $x=0$

$$9) f(x) = \begin{cases} 3x^2 - 20 & (x \leq 3) \\ x + 5 & (x > 3) \end{cases} \quad \begin{matrix} y=7 \\ y=8 \end{matrix}$$

Jump at  $x=3$

$$8) f(x) = \frac{x^2 + 2x}{x^2 + 5x + 6}$$

$$\frac{\cancel{x}(x+2)}{(x+2)(x+3)}$$

Removable at  $x=-2$   
Infinite at  $x=-3$

$$10) f(x) = \begin{cases} x+7 & (x \neq -1) \\ 6 & (x = -1) \end{cases} \quad \begin{matrix} y=6 \\ y=6 \end{matrix}$$

Continuous

$$11) f(x) = \begin{cases} \frac{10}{x-3} & (x < 2) \\ x-12 & (x \geq 2) \end{cases} \quad \begin{matrix} y=-10 \\ y=-10 \end{matrix}$$

Continuous

$$12) f(x) = \begin{cases} x-12 & (x < 2) \\ \frac{10}{x-3} & (x \geq 2) \end{cases} \quad \begin{matrix} y=-10 \\ y=-10 \end{matrix}$$

Infinite at  $x=3$

$$13) f(x) = \frac{x^2 + 2x}{2}$$

Continuous

$$14) f(x) = \frac{x^5 - 8x^3 + x^2 + 6}{x-1}$$

Removable at  $x=1$