Name

Indicate the type and locations of any discontinuities in the functions below.

$$f(x) = \frac{x^{2} + x - 12}{x + 4}$$

$$f(x) = \frac{x^{3} + 3x - 4}{x - 1}$$

$$f(x) = \frac{x^{3} + 3x - 4}{x - 1}$$

$$f(x) = \frac{3x^{2} - 14x - 5}{x^{2} - 25}$$

$$f(x) = \begin{cases} x^{2} - 5 & (x < 2) \\ 3x - 7 & (x \ge 2) \end{cases}$$

$$f(x) = \begin{cases} x & (x < -1) \\ \frac{3}{x - 3} & (x \ge -1) \end{cases}$$

For questions 7-8 fill in the blank with the choice which describes the function at the point indicated.

 $A \rightarrow$ the function has an Asymptotic (or infinite) discontinuity $R \rightarrow$ the function has a Removable (or point) discontinuity $J \rightarrow$ the function has a Jump discontinuity $C \rightarrow$ the function is Continuous

$$f(x) = \begin{cases} \frac{x}{x^2 - 2x} & (x \le 1) \\ \frac{-x - 1}{2} & (x > 1) \end{cases} \qquad \qquad f(x) = \begin{cases} \frac{-x - 1}{2} & (x \le 1) \\ \frac{x}{x^2 - 2x} & (x > 1) \end{cases}$$

at x = 0 _____ at x = 1 _____ at x = 2 _____ at x = 0 _____ at x = 1 _____ at x = 2 _____

8) Fill in the domains for the piecewise function so that the function is continuous.

$$f(x) = \begin{cases} x^2 + 3x + 2 & x < _ \\ x^2 + 4x - 7 & x \ge _ _ \end{cases}$$

9) The graph of f(x) is shown below. Complete the equation of function f(x) shown in factored form.



Bonus: What value of c makes f(x) a continuous function?

$$f(x) = \begin{cases} \frac{x^3 - 2x^2 + x - 2}{x^2 - x - 2} & (x \neq 2) \\ c & (x = 2) \end{cases}$$