

11.11.1

Simplify. State any restrictions on the

$$\frac{-27x^3y}{9x^4y}$$

$$\frac{(\cancel{9})(-3)(\cancel{x})(\cancel{x})(\cancel{x})(\cancel{y})}{(\cancel{9})(\cancel{x})(\cancel{x})(\cancel{x})(\cancel{x})(\cancel{y})}$$

Step 1: Factor

Step 2: Find discontinuities

$$x=0 \quad y=0$$

Step 3: Simplify

$$\boxed{\frac{-3}{x} \quad x \neq 0 \quad y \neq 0}$$

11.12.1

Simplify. State any restrictions on the

$$\frac{-6 - 3x}{x^2 - 6x + 8}$$

Step 1: Factor

$\begin{array}{c} a \cdot c \\ 8 \\ -4 \quad -2 \\ + \\ -6 \\ b \end{array}$
 $\begin{array}{c} x \quad -4 \\ x^2 \quad -4x \\ -2x \quad 8 \end{array}$

Step 2: Find discontinuities

$$\begin{array}{ll} x-4=0 & x-2=0 \\ x=4 & x=2 \end{array}$$

Step 3: Simplify

$$\frac{-3(2+x)}{(x-4)(x-2)} \quad x \neq 4, x \neq 2$$

$$\frac{-3(2+x)}{(x-4)(x-2)}$$

11.13.1

Simplify. State any restrictions on the

$$\frac{2x^2 - 3x - 2}{x^2 - 5x + 6}$$

$$\frac{(2x+1)(\cancel{x-2})}{(\cancel{x-2})(x-3)}$$

Step 1: Factor

Factorization of numerator (blue):

$2x$	1
$2x^2$	$1x$
$-4x$	-2

Factors: $(2x+1)(x-2)$

Factorization of denominator (red):

x	-2
x^2	$-2x$
$-3x$	6

Factors: $(x-2)(x-3)$

Step 2: Find discontinuities * Denominator *

$$(x-2)=0 \quad (x-3)=0$$

$$x=2 \quad x=3$$

Step 3: Simplify

$$\frac{2x+1}{x-3} \quad x \neq 2, x \neq 3$$