

Factor each completely.

1. $24x^6 + 90x^4 - 24x^2$

2. $162x^8 - 32x^4$

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$$= 2x^4(81x^4 - 16)$$

$$= 2x^4(9x^2 + 4)(9x^2 - 4)$$

$$= 2x^4(9x^2 + 4)(3x + 2)(3x - 2)$$

1. $24x^6 + 90x^4 - 24x^2$

$$= 6x^2(4x^4 + 15x^2 - 4)$$

$$= 6x^2(x^2 + 4)(4x^2 - 1)$$

$$= 6x^2(x^2 + 4)(2x + 1)(2x - 1)$$

x^2	$+4$
$4x^2$	$+16$
-1	-4

Factor each completely.

3. $21x^4 + 35x^3 - 84x^2 - 140x$

$$7x(3x^3 + 5x^2 - 12x - 20) = 7x(x^2 - 4)(3x + 5)$$

x^2	$3x^3$	$+5x^2$
-4	$-12x$	-20

$$= 7x(x + 2)(x - 2)(3x + 5)$$

Simplify. State restrictions on the variables.

$$\frac{2x^2 - 50}{2x^2 - 3x - 35} = \frac{2(x^2 - 25)}{(2x+7)(x-5)} = \frac{2(x+5)(x-5)}{(2x+7)(x-5)}$$

$\begin{array}{r} -70 \\ -10 \quad +7 \\ -3 \end{array}$
 $\begin{array}{r} x \quad -5 \\ 2x \quad 2x^2 \quad -10x \\ +7 \quad +7x \quad -35 \end{array}$

$$= \frac{2(x+5)}{2x+7}$$

$x = 5, -7/2$

You can now finish Hwk #4:

Practice Sheet

Chapter 9 Skills Preview

Simplify. State restrictions on the variables.

$$\frac{6x^3 + 18x^2}{4x^3 + 4x^2 - 24x} = \frac{6x^2(x+3)}{4x(x+3)(x-2)}$$

$4x(x^2 + x - 6)$
 $\begin{array}{r} -6 \\ +3 \quad -2 \\ +1 \end{array}$

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

$x \neq 0, -3, 2$

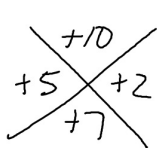
Section 9-3: Graphs of Rational Functions

Simplify:

State restrictions on the variable.

$$\frac{8x^2 + 16x}{x^2 + 7x + 10}$$

$$\frac{8x^2 + 16x}{x^2 + 7x + 10} = \frac{8x(x+2)}{(x+5)(x+2)} = \boxed{\frac{8x}{x+5}}$$



$$x \neq -5, -2$$

When the denominator of a rational function is zero the function is undefined.

Because this value of x can never be used this leads to a break in the graph (it's not continuous)

These breaks in the graph are one of two types:

Vertical Asymptotes

Holes