Review Exercise Set 22

Exercise 1: Simplify.

$$\frac{4x^5 - 8x^4 + 6x^2}{2x^2}$$

Exercise 2: Simplify.

$$\frac{12a^7b^3 - 18a^4b^5 - 21a^3b^8}{3a^2b}$$

Exercise 3: Simplify.

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

Exercise 4: Simplify.

$$\frac{2x^3 + 3x^2 - 4x - 6}{2x + 3}$$

Exercise 5: Simplify.

$$\frac{-6y^2 + 29}{2y - 4}$$

Review Exercise Set 22 Answer Key

Exercise 1: Simplify.

$$\frac{4x^5 - 8x^4 + 6x^2}{2x^2}$$

First, divide each term in the numerator by the denominator and writing it as a sum/difference of quotients

$$= \frac{4x^5}{2x^2} - \frac{8x^4}{2x^2} + \frac{6x^2}{2x^2}$$

Reduce

$$= 2x^3 - 4x^2 + 3$$

Exercise 2: Simplify.

$$\frac{12a^7b^3 - 18a^4b^5 - 21a^3b^8}{3a^2b}$$

Divide each term in the numerator by the denominator

$$= \frac{12a^7b^3}{3a^2b} - \frac{18a^4b^5}{3a^2b} - \frac{21a^3b^8}{3a^2b}$$

Reduce

$$= 4a^5b^2 - 6a^2b^4 - 7ab^7$$

Exercise 3: Simplify.

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

First, setup the problem in long division format

$$x - 2 \overline{)3x^2 - 2x - 8}$$

Exercise 3 (Continued):

Next, divide the leading factor in the dividend by the leading term of the divisor to determine the first factor in the quotient

$$x-2\overline{)3x^2-2x-8}$$

$$\frac{3x^2}{x}=3x$$

Multiply this term with the divisor and subtract it from the dividend to reduce the dividend.

$$\begin{array}{r} 3x \\ x-2\overline{)3x^2-2x-8} \\ \underline{3x^2-6x} \\ 4x-8 \end{array}$$

Repeat the previous steps with the new dividend

$$\frac{4x}{x}=4$$

$$\begin{array}{r} 3x+4 \\ x-2\overline{)3x^2-2x-8} \\ \underline{3x^2-6x} \\ 4x-8 \\ \underline{4x-8} \\ 0 \end{array}$$

Therefore,

$$\frac{3x^2-2x-8}{x-2}=3x+4$$

Exercise 4: Simplify.

$$\frac{2x^3+3x^2-4x-6}{2x+3}$$

Divide using long division

$$\begin{array}{r} x^2 \quad -2 \\ 2x+3\overline{)\,2x^3+3x^2-4x-6} \\ \underline{2x^3+3x^2} \\ -4x-6 \\ \underline{-4x-6} \\ 0 \end{array}$$

Therefore,

$$\frac{2x^3+3x^2-4x-6}{2x+3}=x^2-2$$

Exercise 5: Simplify.

$$\frac{-6y^2+29}{2y-4}$$

Divide using long division

$$\begin{array}{r} -3y-\ 6 \\ 2y-4\overline{)\,-6y^2+\ 0y+29} \\ \underline{-6y^2+12y} \\ -12y+29 \\ \underline{-12y+24} \\ 5 \end{array}$$

Therefore,

$$\frac{-6y^2+29}{2y-4}=-3y-6+\frac{5}{2y-4}$$