3.2 Common Factors

Math 10 **Common Factors**

Recall the distributive property: $a(b + c) = ab + ac$

In this lesson we will begin with the answer and determine a possible question.

$$ab + ac = a(b + c)$$

Let's start by identifying common factors. Determine the greatest common factor (GCF) of each set of terms.

	GCF		GCF
3, 6	3	$3x^2$, $6x$	$3x$
12, 18	6	$12m^2$, $18mn$	$6m$
10, 25, 15	5	$10a^3$, $25a^2$, $15a^4$	$5a^2$
9, 12, 6	3	$9x^4y^4$, $12x^3y^2$, $6x^2y^3$	$3x^2y^2$

Removing the GCF from a set of terms in an expression is known as factoring.

Examples: Factor the following expressions by removing the greatest common factor.

$\frac{3x^2}{3x} - \frac{6x}{3x} =$ $3x(x-2)$

$\frac{10a^3}{5a^2} + \frac{25a^2}{5a^2} - \frac{15a^4}{5a^2} =$ $5a^2(2a + 5 - 3a^2)$

$\frac{12m^2}{6m} + \frac{6mn}{6m} =$ $6m(2m + n)$

$\frac{9x^4y^4}{3x^2y^2} + \frac{12x^3y^2}{3x^2y^2} - \frac{6x^2y^3}{3x^2y^2} =$ $3x^2y^2(3x^2y^2 + 4x - 2y)$

Assignment (Part I): p.91 #4, 6

It is possible for a common factor to be any polynomial. In the previous examples the common factors were monomials. Now we will look at binomial common factors.

Examples: Identify the GCF for each pair of terms. Then write each expression in factored form.

$\underset{\cancel{x-2}}{5x(\cancel{x-2})} - \underset{\cancel{x-2}}{3(\cancel{x-2})} = \overset{\text{GCF}}{(x-2)}(5x-3)$ $\qquad$ $\underset{\cancel{x+1}}{7x(\cancel{x+1})} + \underset{\cancel{x+1}}{y(\cancel{x+1})} = (x+1)(7x+y)$

GCF = $x-2$

$2b(b+4) + 5(b+4) = \underbrace{(b+4)(2b+5)}_{\text{factored form}}$ $\qquad$ $4c(c-3) - 5(c-3) = (c-3)(4c-5)$

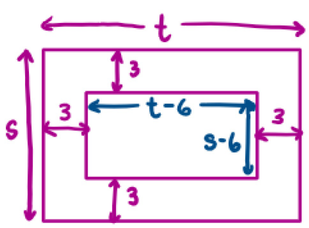
Assignment (Part II): p.91 #8, 9, ~~11~~, 14

9e) $b^2 - 7b - 3b + 21$

$= b(b-7) - 3(b-7)$

$= (b-7)(b-3)$

14.



a) The dimensions are $t-6$ and $s-6$.

b) $A = (t-6)(s-6)$

$= (10-6)(8-6)$

$= (4)(2)$

$= 8\text{ cm}^2$