

## Algebra 1: Ch. 7 Greatest Common Factoring

Define "Factors": #s you can divide by and get a whole #.

$$12 \div 1 = 12$$

$$12 \div 2 = 6$$

$$12 \div 3 = 4$$

$$12 \div 4 = 3$$

$$12 \div 6 = 2$$

$$12 \div 12 = 1$$

So factors of 12: 1, 2, 3, 4, 6, 12

Warm Up: What is the biggest number that goes into all of the following numbers?

24	}	36	}	52
1, 2, 3, <u>4</u> , 6, 8,		1, 2, 3, <u>4</u> , 6, 9,		1, 52, 2, 26,
12		12, 18, 36		<u>4</u> 13,

"Greatest Common Factor"

4

GCF

The biggest factor that goes into a list of numbers.

Ex 2: Find the GCF of 32 and 24.

32: 1, 2, 4, 8, 16, 32

24: 1, 2, 3, 4, 6, 8, 12, 24

GCF: 8

Variables and Exponents in GCFs:

if the same variable is in every term, it is also considered to be part of the Greatest Common Factor. If the variables are all being raised to various exponents, look to see what the smallest exponent is.

Ex 4: State the GCF of the terms in the expression...

$$- 4x^3 + 2x^2 - 6x^5 - 12x^4$$

2 is the biggest # that goes into 4, 2, 6, 12.


$$2x^2$$

x is in all terms. So x is a part of GCF. Smallest power is 2.

Ex 5: Identify the GCF of the following expression.

$$6x^5 - 15x^1 + 12x^3 - 21x^2$$

$$\text{GCF: } 3x$$

"Factoring out" the GCF.

When you "Factor Out" something, you basically divide every term by the thing you "factored out", and leave what is left inside parentheses.

Looking at a previous example, factor out the GCF.

$$\frac{4x^3}{2x^2} + \frac{2x^2}{2x^2} - \frac{6x^5}{2x^2} - \frac{12x^4}{2x^2}$$

$$\text{GCF: } 2x^2$$

$$\text{Answer: } 2x^2(2x + 1 - 3x^3 - 6x^2)$$

Try it yourself.

Factor out the GCF of the following expression.

$$\frac{-16x^4}{8x^3} - \frac{8x^{10}}{8x^3} + \frac{40x^3}{8x^3} + \frac{32x^5}{8x^2} \quad \text{GCF} = 8x^3$$

$$8x^3(-2x - 1x^7 + 5 + 4x^2)$$

Homework: Greatest Common Factor Exit Ticket