

8.4	Name:	Date:
	Goal: Factor Polynomials: GCF	Class/Period:

Method

Questions/Main Ideas:	Notes:
<p>What is a prime number? A prime number is a number that has only 2 factors of 1 and itself. (1,3,5,7,11) are a few examples of prime numbers</p> <p>Prime Factorization: Finding factors of a number that are all prime</p> <p>What is Factoring? $x^2 + x + 20$ () ()</p> <p>Let's Begin:</p> <p>Step 1: Break down each number(term) into prime factorization</p> <p>Step 2: Circle the common factors; (both the variables and the numbers) The circled answer is the GCF.</p> <p>Step 3: Box in what is left over for each term</p> <p>Step 4: Write your answer GCF(Left over)</p>	<p style="text-align: center;">Prime Factorization Review Find the prime factorization of both 12 and 42.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>12</p> </div> <div style="text-align: center;"> <p>42</p> </div> </div> <p>Example: Factor $12x + 42y$</p> <p>Step 1: Prime factorization (Already Done)</p> <p>Step 2: Circle GCF $12x: \textcircled{3} \textcircled{2} \boxed{2 \cdot x}$ $\rightarrow 6$ $42y: \textcircled{3} \textcircled{2} \boxed{7 \cdot y}$</p> <p>Step 3: Box in leftovers</p> <p>Step 4: Write your answer GCF(leftovers)</p> <p>Check: $12x + 42y$ $6(2x + 7y)$</p>

Factor: $4x^4 + 24x^3$

Step 1:
Prime factorization

$$\begin{array}{c} 4 \\ \wedge \\ \textcircled{2\ 2} \end{array}$$

$$\begin{array}{c} 24 \\ \wedge \\ 8\ 3 \\ \wedge \\ 4\ 2 \\ \wedge \\ \textcircled{2\ 2} \end{array}$$

Step 2:
Circle GCF

$$\begin{array}{l} 4x^4: \textcircled{2}\textcircled{2}\cdot x\cdot x\cdot x\cdot x \\ 24x^3: \textcircled{2}\textcircled{2}\cdot \boxed{2\cdot 3}\cdot x\cdot x\cdot x \end{array} \rightarrow 4x^3$$

Step 3:
Box in leftovers

$$\begin{array}{l} \text{GCF (leftovers)} \\ 4x^3(x+6) \end{array}$$

Check:
 $4x^4 + 24x^3$

Factor: $14m + 35n$

14
^
7 2

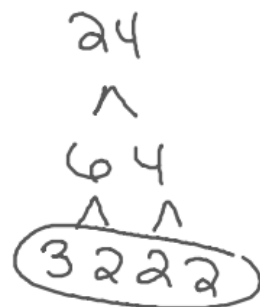
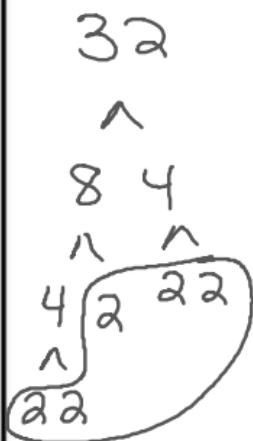
35
^
5 7

$$14m: \textcircled{7} \cdot \boxed{2} \cdot m$$

$$35n: \boxed{5} \cdot \textcircled{7} \cdot n \quad \rightsquigarrow 7$$

$$7(2m + 5n)$$

Factor $32x^2 + 24x^4$



$$32x^2: \textcircled{2}\textcircled{2}\textcircled{2}\boxed{2 \cdot 2} \textcircled{x}\textcircled{x} \rightarrow 8x^2$$

$$24x^4: \textcircled{2}\textcircled{2}\textcircled{2}\boxed{3} \textcircled{x}\textcircled{x}\boxed{x \cdot x}$$

$$8x^2(4 + 3x^2)$$

Factor: $81x^3 + 21x^2 - 18x$

$$81x^3 + 21x^2 - 18x$$

* To handle a (-) use -1 as a factor.

$$\begin{array}{c} 81 \\ \wedge \\ 9 \ 9 \\ \wedge \quad \wedge \\ \textcircled{3 \ 3} \ \textcircled{3 \ 3} \end{array}$$

$$\begin{array}{c} 21 \\ \wedge \\ \textcircled{7 \ 3} \end{array}$$

$$\begin{array}{c} 18 \\ \wedge \\ 9 \ 2 \\ \wedge \quad \wedge \\ \textcircled{3 \ 3} \end{array}$$

$$\begin{array}{l} 81x^3: \textcircled{3} \cdot \textcircled{3} \cdot \textcircled{3} \cdot \textcircled{3} \cdot \textcircled{x} \cdot \textcircled{x} \cdot \textcircled{x} \\ 21x^2: \textcircled{3} \cdot \textcircled{7} \cdot \textcircled{x} \cdot \textcircled{x} \\ -18x: \textcircled{3} \cdot \textcircled{3} \cdot \textcircled{2} \cdot \textcircled{-1} \cdot \textcircled{x} \end{array} \left. \vphantom{\begin{array}{l} 81x^3 \\ 21x^2 \\ -18x \end{array}} \right\} 3x$$

$$3x(27x^2 + 7x - 6)$$

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Summary:

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