Section 6.4

TERMINOLOGY 6.4

For each of the following terms, provide 1) a definition in your own words, 2) the formal definition (as provided by your text or instructor), and 3) an example of the term using a drawing or problem. A sample filled-out form is available in the Introduction.

Factor (verb)

Your definition	
Formal definition	
Example	

Greatest Common Factor

Your definition	
Formal definition	
Example	

READING AND SELF-DISCOVERY QUESTIONS 6.4

1. What does the acronym GCF stand for?
   Greatest Common Factor

2. How do you find the GCF for variables (for example x^3 and x^8)? Please phrase your answer in general terms.
   The GCF is the largest factor that belongs to both terms.

3. Factoring an expression is the reverse of what property?

Distributive Property

CRITICAL THINKING QUESTIONS 6.4

1. How do you know if you have completely factored an expression?

There are no common factors in the remaining terms.

2. What is the difference between a common factor and the GCF?

The GCF is larger than a common factor, which is a factor of the GCF.

3. What do prime numbers have to do with the GCF?

Using prime number is a way to determine which factors are common without making a mistake.

DEMONSTRATE YOUR UNDERSTANDING 6.4

1. Find the greatest common factor (GCF) of $7x^2z + 14xy^2z^6$

The GCF is $7xz$.

2. Factor the expression $7x^2z + 14xy^2z^6$

$7xz\left(x + 2y^2z^5\right)$

3. Factor $3a^2bc^3 + 6bc^2 - 9a^3b^3c$. Check your answer.

$3bc\left(a^2c^2 + 2c - 3a^3b^2\right)$ **Validate by expanding:** $3a^2bc^3 + 6bc^2 - 9a^3b^3c$

IDENTIFY AND CORRECT THE ERRORS 6.4

In the second column, identify the error(s) you find in the following worked solution and describe the error made. Solve the problem correctly in the third column.

Problem	Describe Error	Correct Process
Factor: $8a^2b - 16ab$ **Worked Solution** *(What is wrong here?)* $8a^2b - 16ab$ $= \mathbf{8(a^2b - 2ab)}$	**The student has neglected to also factor out common variables. The GCF in this case also includes variables.**	$8a^2b - 16ab$ $8a^2b = 2 \cdot 2 \cdot 2 \cdot a \cdot a \cdot b$ $16ab = 2 \cdot 2 \cdot 2 \cdot 2 \cdot a \cdot b$ $\text{GCF} = 2 \cdot 2 \cdot 2 \cdot a \cdot b = 8ab$ $= 8ab(a - 2)$