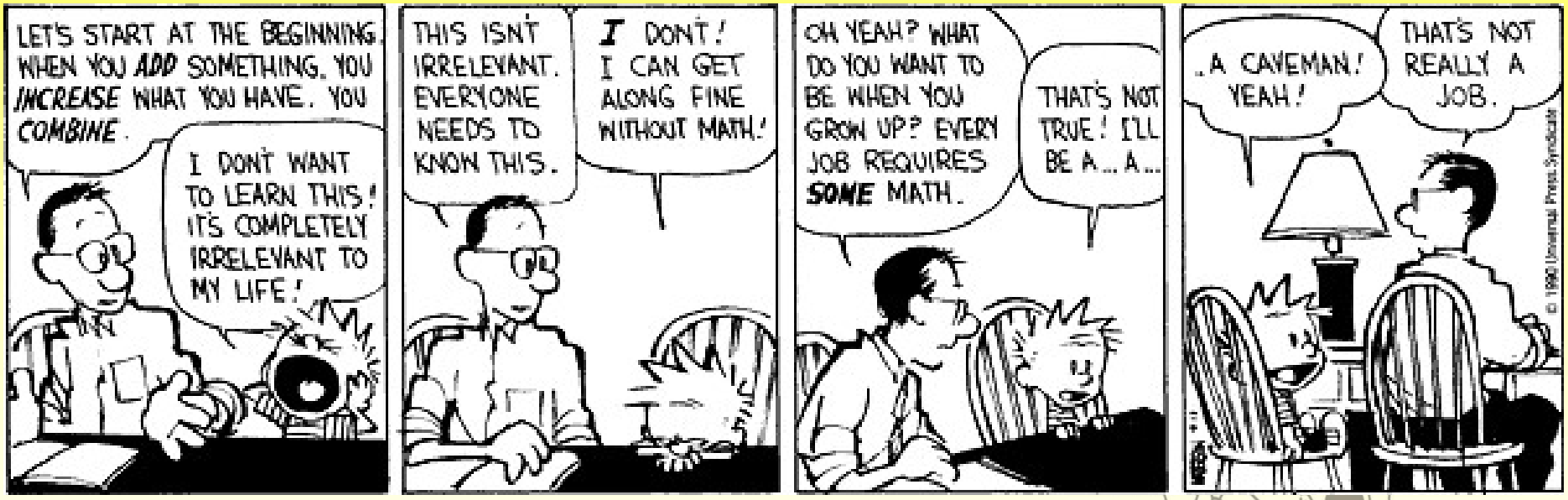
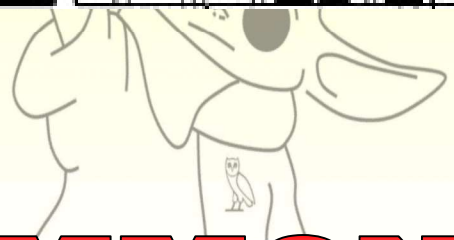
ST. JEAN DE BREBEUF
MATHEMATICS





CHAPTER 7.2
COMMON FACTORING

CABLEAN MATH ONLINE.COM

CHAPTER 7.2 COMMON FACTORING

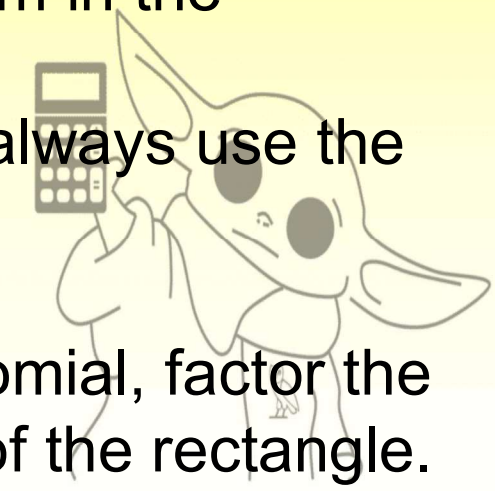
KEY CONCEPTS

Some polynomials can be factored by finding the **GCF (greatest common factor).**

The GCF for a polynomial may be a **constant** (number), a **variable**, or **combination** of both.

→ The GCF must <u>divide evenly</u> into each term in the polynomial

→When finding the GCF of a variable term, always use the exponent with the <u>lowest value</u>



If the area of a rectangle is given as a polynomial, factor the polynomial to find the possible side lengths of the rectangle.

CABILAN MATH ONLINE.COM

CHAPTER 7.2 COMMON FACTORING

EXAMPLE 1

Getting Ready: Determining the Greatest Common Factor

Find the **greatest common factor (GCF)** for each set of terms

(a) 3x, 15 GCF = 3

(b) $10x^2$, 25x GCF = 5x

*(c) $-4x^3$, $12x^2$, 20x GCF = $-4x$

If the variable with the *highest* exponent has a negative number in front, it is usually part of the GCF

The GCF for a polynomial may be a **constant** (number), a **variable**, or **combination** of both.

→ The GCF must divide evenly into each term in the polynomial

→When finding the GCF of a variable term, always use the exponent with the lowest value

CABILAN MATH ONLINE.COM

CHAPTER 7.2 COMMON FACTORING

EXAMPLE 2 *Common Factoring*

Factor the following expressions:

(a) $3x + 15$ GCF = 3

$\frac{3x}{3} \quad \frac{15}{3}$

$= 3(x + 5)$

(b) $10x^2 - 25x$ GCF = $5x$

$\frac{10x^2}{5x} \quad \frac{25x}{5x}$

$= 5x(2x - 5)$

COMMON FACTORING

1. Determine the GCF. Write the GCF in front of the brackets.

2. Divide each term by the GCF and write down the answers inside the brackets.

CHAPTER 7.2 COMMON FACTORING

EXAMPLE 2 *Common Factoring*

Factor the following expressions:

(c) $\dfrac{-4x^3}{-4x} + \dfrac{12x^2}{-4x} - \dfrac{20x}{-4x}$ GCF = $-4x$

$$= -4x\,(\,x^2 - 3x + 5\,)$$

COMMON FACTORING

1. Determine the GCF. Write the GCF in front of the brackets.

2. Divide each term by the GCF and write down the answers inside the brackets.

CHAPTER 7.2 COMMON FACTORING

EXAMPLE 3

Application: Finding the Dimensions of a Rectangle

The area of a CD case is represented by the binomial $\mathbf{16}x + \mathbf{4}x^2$.

(a) Factor the area of the CD case to determine the expression for its dimensions

$16x + 4x^2$ GCF = $4x$

$4x$ $4x$

$= 4x(4 + 1x)$

Length

Width

(b) Using the expressions from (a), determine the actual dimensions if **x = 5 cm**.

Length = $4x$
$= 4(5)$
$= \mathbf{20\ cm}$

Width = $4 + 1x$
$= 4 + 1(5)$
$= \mathbf{9\ cm}$

COMMON FACTORING

1. Determine the GCF. Write the GCF in front of the brackets.

2. Divide each term by the GCF and write down the answers inside the brackets.

CHAPTER 7.2 COMMON FACTORING

EXAMPLE 3

Application: Finding the Dimensions of a Rectangle

(c) Determine an algebraic expression for the **Perimeter** using the expressions from (a) and substituting them into the formula given

Perimeter = 2l + 2w

= 2(4x) + 2(4 + 1x)

= 8x + 8 + 2x

= 10x + 8

Length = 4x

Width = 4 + 1x

Substitute **l** with *4x* and **w** with *4 + 1x*

COMMON FACTORING

1. Determine the GCF. Write the GCF in front of the brackets.

2. Divide each term by the GCF and write down the answers inside the brackets.

CHAPTER 7.2 COMMON FACTORING

Homework:

Page 294 – 297

#1ac, 2acd, 3acd, 4ac,

6acd, 7ab, 8a, 9ab