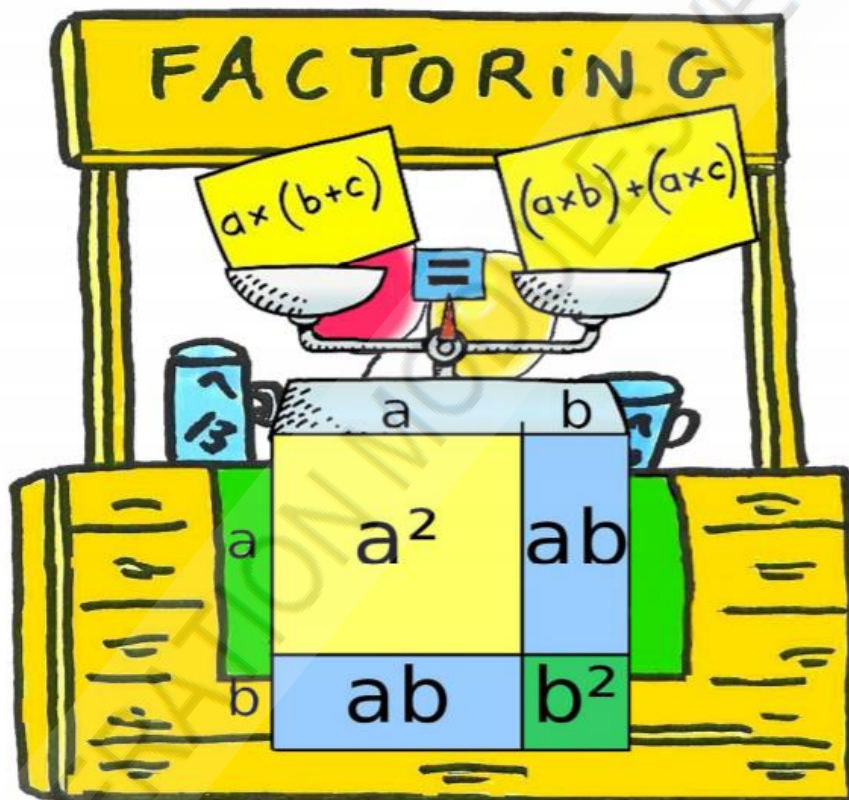


Mathematics

First Quarter – Module 10:

Factoring Polynomials



Government Property
NOT FOR SALE

Mathematics - Grade 10
Alternative Delivery Mode
Quarter 1 – **Module 10 : Factoring Polynomials**
First Edition, 2020

REPUBLIC Act 8293, section 176 states that No copyright shall subsist in any work of the Government of the Philippines. However, prior approval of the government agency or office wherein the work is created shall be necessary for exploitation of such work for profit. Such agency or office may, among other things impose as a condition the payment of royalties.

Borrowed materials (i.e., songs, stories, poems, pictures, photos, brand names, trademarks, etc.) included in this book are owned by their respective copyright holders. Every effort has been exerted to locate and seek permission to use this materials from their respective copyright owners. The publisher and authors do not represent nor claim ownership over them.

Published by the Department of Education
Secretary: **Leonor Magtolis Briones**
Undersecretary: **Diosdado M. San Antonio**

Development Team of the Module

Writers: Elsie M. Bacunawa & Egar R. George
Editor: Pamela A. Rodemio
Reviewers: Dr. Anecita U. Mendez (Moderator)
Mr. Carmelito M. Lauron Sr.
Illustrator and Layout Artist: Myrna P. Soco

Management Team

Schools Division Superintendent:
Dr. Marilyn S. Andales, CESO V
Assistant Schools Division Superintendents:
Dr. Cartesa M. Perico
Dr. Ester A. Futralan
Dr. Leah B. Apao
Chief, CID: Dr. Mary Ann P. Flores
EPS in LRMS: Mr. Isaiash T. Wagas
EPS in Math: Dr. Pamela A. Rodemio

Printed in the Philippines by:
Department of Education, Region VII, Division of Cebu Province Office
Address: IPHO Bldg. Sudlon, Lahug, Cebu City
Telefax: (032) 255 - 6405
Email Address: cebu.province@deped.gov.ph

10

Mathematics

First Quarter – Module 10:

Factoring Polynomials



Introductory Message

This module is carefully designed to continually facilitate learners to achieve mastery on the Most Essential Learning Competencies and develop their 21st century skills. This module consists of essential components developed appropriately for self-instructional mode of learning. The components come in various developmental purposes that are designed to diagnose (pretest), recall and associate (review), discuss, explain and even provide practice activities, enrichment tasks, assessments and answer keys.

Upon taking the pretest, determine whether you need to take or skip this module. At 100% accuracy, you possess the mastery of the topic in the module; hence, you don't need to take it and you may choose to proceed to the next module. At 99% and below, you are recommended to undertake the module to acquire the necessary skills.

Though allowed, adult supervision is limited only to providing assistance in accomplishing this module. It is highly recommended that YOU, the learner, should try to engage independently in doing the different tasks for you to become a critical thinker and problem solver which are the twin goals of Mathematics.

May this module be utilized to its fullest extent in the purpose of learning the competencies construed as Most Essential for a learner in this level.

God bless and enjoy learning!

PAMELA A. RODEMIO
Education Program Supervisor - MATH

Factoring Polynomials

Most Essential Learning Competency:

The learner factors polynomials. (M10AL-Ih-1)



What I Need to Know

In Mathematics, factoring is the breaking part of a polynomial into a product of another smaller polynomials. In this lesson the learners will be able to factor polynomials using factor theorem, remainder theorem, rational root theorem or even synthetic division.

In this lesson the learner:

1. illustrates factorization
2. factors polynomials
3. shows reliance when working independently



What I know

Find out how much you already know about the content of this module. Write the letter that corresponds to your answer on a separate answer sheet. Take note of the items that you were not able to answer correctly and find the right solution as you go through this module.

1. Which of the following is a factor of $x^4 + x^3 - x^2 - x - 18$?
 A. $x - 2$ B. $x - 5$ C. $x + 7$ D. $x + 5$
2. Factor $x^3 + 2x^2 - 9x - 18$.
 A. $(x+3)(x-3)(x-2)$ B. $(x+3)(x+3)(x-2)$ C. $(x+3)(x-3)(x+2)$ D. $(x+3)(x+3)(x+2)$
3. Factor $8x^3 - 729$ completely.
 A. $(2x - 9)(4x^2 - 18x + 81)$ B. $(2x+9)(4x^2 - 18x + 81)$
 C. $(2x + 9)(4x^2 + 18x + 81)$ D. $(2x - 9)(4x^2 + 18x + 81)$
4. Factor $P(x) = x^4 + x^3 + x^2 + x$.
 A. $x(x+1)(x^2+1)$ B. $x(1)(x^2+1)$ C. $x(x-1)(x^2+1)$ D. $x(-1)(x^2+1)$
5. Which of the following is a factor of $f(x) = x^3 - 5x^2 - 29x + 105$?
 A. $x - 5$ B. $x - 3$ C. $x + 3$ D. $x - 4$
6. What is the other factor of $p(x) = x^3 + 3x^2 - 5x - 10$ when one of its factor is $x - 2$?
 A. $x^2 + 5x - 5$ B. $x^2 + 5x + 5$ C. $x^2 - 5x + 5$ D. $x^2 - 5x - 5$
7. Which of the following is NOT a factor of $x^4 - 4x^3 - 5x^2 + 36x + 36$?
 A. $x + 2$ B. $x - 2$ C. $x + 3$ D. $x - 3$
8. Which polynomial is equal to $25y^2 - x^2$?
 A. $(5y+x)(5y+x)$ B. $(5y+x)(5y-x)$ C. $(5x - y)(5y-x)$ D. $(5x+y)(5y-x)$

9. Which of the following has factors $(x+2)(x-2)$ and $(x-4)$?
- A. $x^3 + 4x^2 - 4x + 16 = 0$ B. $x^3 - 4x^2 - x - 16 = 0$
 C. $x^3 - x^2 - x + 16 = 0$ D. $x^3 - 4x^2 - 4x + 16 = 0$
10. Which of the following cubic polynomials has roots $\frac{-3}{2}$, -2 and 2 ?
- A. $2x^3 + 3x^2 - 8x - 12 = 0$ B. $2x^3 + 3x^2 + 8x - 12 = 0$
 C. $2x^3 + 3x^2 + 8x + 12 = 0$ D. $2x^3 - 3x^2 - 8x - 12 = 0$
11. Which of the following is the factor of $x^2 - 6x - 16$?
- A. $(x-8)(x-2)$ C. $(x-8)(x+2)$
 B. $(x+8)(x+2)$ D. $(x+8)(x-2)$
12. Which of the following has the factor of $(x+8)(x-6)$?
- A. $x^2 + 2x - 48$ C. $x^2 + 14x - 48$
 B. $x^2 - 2x + 48$ D. $x^2 - 14x - 48$
13. Which of the following has the factor of $3xy(x+7)(x-1)$?
- A. $-3x^3y - 18x^2y - 21xy$ C. $3x^3y + 18x^2y - 21xy$
 B. $3x^3y + 18x^2y + 21xy$ D. $3x^3y - 18x^2y - 21xy$
14. What is the other factor of $x^2 + 10x + 16$ when one of its factors is $x + 8$?
- A. $x - 2$ B. $x + 2$ C. $x - 8$ D. $x + 8$
15. Which of the following is NOT a factor of $2x^3 - 4x^2 - 6x$?
- A. $2x$ B. $x - 3$ C. $x + 1$ D. $x - 1$



What's In

Use the Remainder Theorem to find the remainder when the given polynomial is divided by each binomial.

- $P(x) = x^3 - 7x + 5$
 - $x - 1$
 - $x + 1$
 - $x - 2$
- $P(x) = 4x^4 - 3x^3 - x^2 + 2x + 1$
 - $x - 1$
 - $x + 1$
 - $x - 2$
- $P(x) = 2x^4 - 3x^3 + 4x^2 + 17x + 7$
 - $2x - 3$
 - $2x + 3$
 - $3x - 2$



What's New

Task 1

1. Let $f(x) = 2x^3 + x^2 - 7x - 6$. Use the factor theorem to determine whether each of the following is a factor of $f(x)$.

- $x - 1$
 - $2x + 3$
2. It is given that $f(x) = x^3 + 6x^2 + 5x - 12$.
- Show that $x - 1$ is a factor of $f(x)$.
 - Hence, factorize $f(x)$ completely.

Task 2

- Factorize $2x^3 - 5x^2 - 6x + 4$.
- Hence, solve $2x^3 - 5x^2 - 6x + 4 = 0$



What is It

Considering the factors of the leading coefficient and the constant term, all the possible linear factors of the polynomial $f(x)$ can be found. Let us see the following examples.

1. Let $f(x) = 2x^3 + x^2 - 7x - 6$. Use the factor theorem to determine whether each of the following is a factor of $f(x)$.
 - a. $x - 1$
 - b. $2x+3$

Solution :

$$\begin{aligned} \text{a. } f(1) &= 2(1)^3 + (1)^2 - 7(1) - 6 \\ &= 2+1 - 7 - 6 \\ &= -10 \end{aligned}$$

Thus , $x - 1$ is not a factor of $f(x)$.

$$\begin{aligned} \text{b. } f\left(\frac{-3}{2}\right) &= 2\left(\frac{-3}{2}\right)^3 + \left(\frac{-3}{2}\right)^2 - 7\left(\frac{-3}{2}\right) - 6 \\ &= -\frac{27}{4} + \frac{9}{4} + \frac{21}{2} - 6 \\ &= 0 \end{aligned}$$

Hence , $2x+3$ is a factor of $f(x)$.

2. It is given that $f(x) = x^3 + 6x^2 + 5x - 12$.
 - a. Show that $x - 1$ is a factor of $f(x)$.
 - b. Hence, factorize $f(x)$ completely.

Solution:

$$\begin{aligned} \text{a. Since } f(1) &= (1)^3 + 6(1)^2 + 5(1) - 12 \\ &= 1+6+5 -12 \\ &= 0 \end{aligned}$$

Thus $x - 1$ is a factor of $f(x)$.

b. By synthetic division,

$$\begin{array}{r|rrrrr} 1 & 1 & 6 & 5 & -12 & \\ & & 1 & 7 & 12 & \\ \hline & 1 & 7 & 12 & 0 & \end{array}$$

The depressed equation is $x^2+7x+12 = 0$.

$$\begin{aligned} \text{Therefore, } f(x) &= (x-1)(x^2+7x+12) \\ &= (x - 1)(x+3)(x+4). \end{aligned}$$

Considering the factors of the leading coefficient and the constant term, all the possible linear factors of the polynomial $f(x)$ can be found. Let us see the following.

1. Factorize $2x^3 - 5x^2 - 6x + 4$.

$$\begin{aligned} \text{Since } f\left(\frac{1}{2}\right) &= 2\left(\frac{1}{2}\right)^3 - 5\left(\frac{1}{2}\right)^2 - 6\left(\frac{1}{2}\right) + 4 \\ &= \frac{1}{4} - \frac{5}{4} - 3 + 4 \\ &= 0 \end{aligned}$$

Then $2x - 1$ is a factor of $f(x)$.

By synthetic division,

$$\begin{array}{r|rrrr} \frac{1}{2} & 2 & -5 & -6 & 4 \\ & & 1 & -2 & -4 \\ \hline & 2 & -4 & -8 & 0 \end{array}$$

Thus, $2x^3 - 5x^2 - 6x + 4 = (2x-1)(x^2 - 2x - 4)$.

$$2. 2x^3 - 5x^2 - 6x + 4 = 0$$

$$(2x - 1)(x^2 - 2x - 4) = 0$$

$$\begin{aligned} x = \frac{1}{2} \quad \text{and by quadratic formula } x &= \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-4)}}{2(1)} \\ &= \frac{2 \pm \sqrt{20}}{2} \\ &= \frac{2 \pm 2\sqrt{5}}{2} \\ &= 1 \pm \sqrt{5} \end{aligned}$$



A. Independent Activity 1

Find the missing factor in each of the following. Write your answers in your notebook.

1. $x^3 - 8 = (x-2)(\underline{\hspace{2cm}})$
2. $2x^3 + x^2 - 23x + 20 = (x+4)(\underline{\hspace{2cm}})$
3. $3x^3 + 2x^2 - 37x + 12 = (x - 3)(\underline{\hspace{2cm}})$
4. $x^3 - 2x^2 - x + 2 = (x - 2)(\underline{\hspace{2cm}})$
5. $2x^3 - x^2 - 2x + 1 = (2x - 1)(\underline{\hspace{2cm}})$

B. Independent Assessment 1

Determine the factors of the following.

1. $x^3 - 4x^2 + 4x - 3$
2. $x^3 + 2x^2 - 11x + 20$
3. $3x^3 - 17x^2 + 22x - 60$
4. $4x^3 + 20x^2 - 47x + 12$
5. $4x^4 - 2x^3 - 4x^2 + 16x - 7$

C. Independent Activity 2

Factorize the following:

1. $x^3 - 9x$
2. $2x^3 + x^2 - 8x - 4$
3. $x^3 - 7x^2 + 11x - 5$
4. $x^3 + 2x^2 - 5x - 6$
5. $2x^3 - 14x - 12$

D. Independent Assessment 2

Find the missing factor in each of the following.

1. $4x^4 - 2x^3 - 4x^2 + 16x - 7 = (2x-1)(\underline{\hspace{2cm}})$
2. $3x^3 - 17x^2 + 22x - 60 = (x - 5)(\underline{\hspace{2cm}})$
3. $4x^3 + 20x^2 - 47x + 12 = (2x - 3)(\underline{\hspace{2cm}})$
4. $x^3 + 2x^2 - 11x + 20 = (x+5)(\underline{\hspace{2cm}})$
5. $x^3 - 4x^2 + 4x - 3 = (x - 3)(\underline{\hspace{2cm}})$

E. Independent Activity 3

Read and comprehend each question. Write the letter that corresponds to the correct answer on your answer sheet.

1. Factor $x^2 - 64$.
 A. $(x - 64)(x - 1)$ B. $(x + 8)(x + 8)$ C. $(x - 8)(x - 8)$ D. $(x + 8)(x - 8)$
2. Which of the following is the factor of $x^3 - 7x^2 + 12x$?
 A. $x(x - 4)(x - 3)$ B. $x(x + 4)(x - 3)$ C. $x(x + 4)(x + 3)$ D. $x(x - 4)(x + 3)$
3. Which of the following has the factors $2(5x + 1)$ and $(25x^2 - 5x + 1)$?
 A. $250x^3 + 2$ B. $250x^3 - 2$ C. $250x^3 + 50x^2 + 2$ D. $250x^3 - 50x^2 - 2$
4. What is the other factor of $x^2 - x - 30$ when one of its factors is $x - 6$?
 A. $x - 3$ B. $x + 3$ C. $x + 5$ D. $x - 5$
5. Which of the following is NOT a factor of $6x^3 + 48$?
 A. 6 B. $6x$ C. $x + 2$ D. $x^2 - 2y + 4$

F. Independent Assessment 3

Read and comprehend each question. Write the letter that corresponds to the correct answer on your answer sheet.

1. Factor $x^3 - 343$.
 A. $(x + 7)(x^2 + 7x + 49)$ C. $(x + 7)(x^2 - 7x - 49)$
 B. $(x - 7)(x^2 + 7x + 49)$ D. $(x - 7)(x^2 + 7x + 49)$
2. Which of the following is the factor of $x^3 - 14x^2 + 49x$?
 A. $x(x + 7)(x - 7)$ B. $(x + 7)(x + 7)$ C. $-x(x - 7)(x + 7)$ D. $x(x - 7)^2$
3. Which of the following has the factors $7(x + y)$ and $(x - y)$?
 A. $7x^3 + 7y^3$ B. $7x^2 + 7y^2$ C. $7x + 7y$ D. $7x^3 + 7y^1$
4. What is the other factor of $8x^6 - 125y^6$ when one of its factors is $2x^2 - 5y^2$?
 A. $4x^4 + 10x^2y^2 - 25y^4$ C. $4x^4 + 10x^2y^2 + 25y^4$
 B. $4x^4 - 10x^2y^2 + 25y^4$ D. $4x^4 - 10x^2y^2 - 25y^4$
5. Which of the following is NOT a factor of $40x^2 + 28x - 48$?
 A. $2x + 4$ B. $2x + 3$ C. $5x - 4$ D. 4



What I Have Learned

The following activities will help you assess your understanding on factoring polynomials. Show your solutions on your answer sheet.

1. Angel states that $x^2 - 5x - 36$ and $36 - 5x - x^2$ has the same factors. Is she correct? Prove by showing your solution.
2. Why is the difference of two squares be applicable to $5x^3 - 45$? What are its factors?
3. Determine the value of M so that $(x - 1)$ is a factor of $2x^3 + x^2 + 2Mx + 5$?



What I can Do

The following activities will help you use factoring polynomials to solve real-world problems. Show your solutions on your answer sheet.

1. The volume of a swimming pool is $2x^3 + 5x^2 - 28x - 15$. If the height of the pool is $(x-3)$ meters, what are the dimensions of the rectangular base of the pool?
2. Create a solid figure from a rectangular piece of paper or used folder that measures 15 inches by 9 inches.

Steps:

1. Cut out 2-in by 2-in square in all edges of the material.
2. Fold all the sides upward.
3. Tape the corners to form a solid figure.

Answer the following:

- a. What is the area of the material used?
- b. What is the volume of the solid figure?
- c. If the sides of the squares cut is x , give the dimensions (length, width & thickness) of the solid figure in terms of x .
- d. What is the volume of the solid figure in terms of x ?



Assessment

Read and comprehend each question. Write the letter that corresponds to the correct answer on your answer sheet.

1. What is the other factor of $p(x) = x^3 + 2x^2 - 20x + 15$ when one of its factor is $x - 3$?
 A. $x^2 + 5x - 5$ B. $x^2 + 5x + 5$ C. $x^2 - 5x + 5$ D. $x^2 - 5x + 5$
2. Factor $x^3 - 8$ completely.
 A. $(x - 2)(x^2 + 2x - 4)$ C. $(x + 2)(x^2 + 2x - 4)$
 B. $(x - 2)(x^2 + 2x + 4)$ D. $(x + 2)(x^2 + 2x + 4)$
3. Which polynomial is equal to $36y^2 - x^2$?
 A. $(6y+x)(6y+x)$ B. $(6y+x)(6y-x)$ C. $(6x - y)(6y-x)$ D. $(6x+y)(6y-x)$
4. Factor $P(x) = x^4 + x^3 - x^2 - x$.
 A. $x(x+1)(x^2-1)$ C. $x(x-1)(x^2+1)$
 B. $x(1)(x^2+1)$ D. $x(-1)(x^2+1)$
5. Which of the following is NOT a factor of $x^4 - 4x^3 - 5x^2 + 36x + 36$?
 A. $x+2$ B. $x - 2$ C. $x+3$ D. $x - 3$
6. Which of the following cubic polynomials has roots $-3, 3, -2$ and 2 ?
 A. $x^4 - 13x^2 - 36 = 0$ C. $x^4 - 13x^2 - 36 = 0$
 B. $x^4 - 13x^2 + 36 = 0$ D. $x^4 + 13x^2 - 36 = 0$
7. Which of the following has factors $(x+2)(x-2)$ and $(x+4)$?
 A. $x^3 + 4x^2 - 4x + 16 = 0$ B. $x^3 + 4x^2 - 4x - 16 = 0$
 C. $x^3 - 4x^2 - 4x + 16 = 0$ D. $x^3 - 4x^2 - 4x - 16 = 0$

8. Which of the following is a factor of $x^4 - x^3 - 4x^2 + 8x - 8$?
 A. $x - 2$ B. $x - 5$ C. $x + 7$ D. $x + 5$
9. Factor $x^3 - 2x^2 - 9x + 18$.
 A. $(x+3)(x-3)(x-2)$ C. $(x+3)(x-3)(x+2)$
 B. $(x+3)(x+3)(x-2)$ D. $(x+3)(x+3)(x+2)$
10. Which of the following is a factor of $f(x) = x^5 - 3x^4 - 5x^3 + 18x^2 - 11x + 6$?
 A. $x - 5$ B. $x - 3$ C. $x + 3$ D. $x - 4$
11. Which of the following is the factor of $x^2 + 3x + 2$?
 A. $(x - 2)(x - 1)$ C. $(x - 2)(x + 1)$
 B. $(x + 2)(x + 1)$ D. $(x + 2)(x - 1)$
12. Which of the following has the factors $(x - 7y)$ and $(x - 6y)$?
 A. $x^2 + 13xy - 42y^2$ C. $x^2 - xy + 42y^2$
 B. $x^2 - 13xy + 42y^2$ D. $x^2 + xy - 42y^2$
13. Which of the following is equal to $5xy(x - 5)(x - 2)$?
 A. $5x^3y + 35x^2y + 50xy$ C. $5x^3y + 35x^2y - 50xy$
 B. $5x^3y - 15x^2y + 50xy$ D. $5x^3y - 35x^2y + 50xy$
14. What is the other factor of $x^2 - 8x - 9$ when one of its factors is $x + 1$?
 A. $x - 3$ B. $x + 3$ C. $x - 9$ D. $x + 9$
15. Which of the following is NOT a factor of $2x^3 - 2x^2 - 4x$?
 A. $x + 2$ B. $x - 2$ C. $x + 1$ D. $2x$



Additional Activities

For each item below, give a polynomial equation with integer coefficients that has the following roots.

1. $-1, 3, -6$
2. $\pm 2, \pm 7$
3. $0, -4, -5, \pm 1$
4. $\pm 2, 3, \frac{3}{5}$
5. $\pm 2, -\frac{1}{3}, \frac{2}{7}, 3$



What I Know

11. C	6. B	1. A
12. A	7. A	2. C
13. C	8. B	3. D
14. B	9. D	4. A
15. D	10. A	5. B

What's In

1. a. $P(1) = -1$	1. a. $P(1) = -1$
b. $P(-1) = 11$	b. $P(-1) = 11$
c. $P(2) = -1$	c. $P(2) = -1$
2. a. $P(1) = 3$	2. a. $P(1) = 3$
b. $P(-1) = 5$	b. $P(-1) = 5$
c. $P(2) = 41$	c. $P(2) = 41$
3. a. $P(3/2) = 41\frac{1}{2}$	3. a. $P(3/2) = 41\frac{1}{2}$
b. $P(-\frac{2}{3}) = 10\frac{4}{3}$	b. $P(-\frac{2}{3}) = 10\frac{4}{3}$
c. $P(\frac{3}{2}) = 19\frac{50}{81}$	c. $P(\frac{3}{2}) = 19\frac{50}{81}$

What's More

A. Independent Activity 1

1. $x^2 + 2x + 4$	1. $x^2 + 2x + 4$
2. $2x^2 - 7x + 5$	2. $2x^2 - 7x + 5$
3. $3x^2 + 11x - 4$	3. $3x^2 + 11x - 4$
4. $x^2 - 1$	4. $x^2 - 1$
5. $x^2 - 1$	5. $x^2 - 1$

B. Independent Assessment 1

1. $(x - 3)(x^2 - x + 1)$	1. $(x - 3)(x^2 - x + 1)$
2. $(x + 5)(x^2 - 3x + 4)$	2. $(x + 5)(x^2 - 3x + 4)$
3. $(x - 5)(3x^2 - 2x + 12)$	3. $(x - 5)(3x^2 - 2x + 12)$
4. $(2x - 3)(2x^2 + 13x - 4)$	4. $(2x - 3)(2x^2 + 13x - 4)$
5. $(2x - 1)(2x^3 - 2x + 7)$	5. $(2x - 1)(2x^3 - 2x + 7)$

C. Independent Activity 2

1. $(x)(x+3)(x-3)$	1. $(x)(x+3)(x-3)$
2. $(2x+1)(x+2)(x-2)$	2. $(2x+1)(x+2)(x-2)$
3. $(x-1)(x-1)(x-5)$	3. $(x-1)(x-1)(x-5)$
4. $(x-2)(x+1)(x+3)$	4. $(x-2)(x+1)(x+3)$
5. $(x-2)(x+3)(2x-2)$	5. $(x-2)(x+3)(2x-2)$

D. Independent Assessment 2

1. $2x^3 - 2x + 7$
2. $3x^2 - 2x + 12$
3. $2x^2 + 13x - 4$
4. $x^2 - 3x + 4$
5. $x^2 - x + 1$

E. Independent Activity 3

1. D
2. A
3. A
4. C
5. B

F. Independent Assessment 3

1. B
2. D
3. B
4. C
5. A

What I Have Learned

1. No, Angel is not correct.
 $(x + 4)(x - 9) = x^2 - 9x + 4x - 36 = x^2 - 5x - 36$
 $(-x + 4)(x + 9) = -x^2 - 9x + 4x + 36 = -x^2 - 5x + 36 = 36 - 5x - x^2$
2. $5x^3 - 45 = \frac{5x^3 - 45}{5x} = x^2 - 9$
 Therefore, the factors of $5x^3 - 45$ are: $(5x)(x + 3)(x - 3)$
3. $M = -4$

What I can Do?

1. $L = (x + 5) m$
 $W = (2x + 1) m$
2. a. $(15)(9) = 135$ sq. inches
 b. $(11)(5)(2) = 110$ cubic inches
 c. $L = 15 - 2x$ inches
 $W = 9 - 2x$ inches
 $T = x$ inches
 d. $4x^3 - 48x^2 + 135x$ cubic inches

Assessment

5. A	10. B	11. B
4. A	9. A	12. B
3. B	8. A	13. D
2. B	7. B	14. C
1. A	6. B	15. A

Additional Activities

$$1. x^3 + 4x^2 - 15x - 18 = 0$$

$$2. x^4 - 53x^2 + 196 = 0$$

$$3. x^5 + 9x^4 + 19x^3 - 9x^2 - 20x = 0$$

$$4. 5x^4 - 18x^3 - 11x^2 + 72x - 36 = 0$$

$$5. 21x^5 - 62x^4 - 89x^3 + 254x^2 + 20x - 24 = 0$$

REFERENCES:

Geraldo DG.Banaag, Reymond Anthony M. Quan. (2013).Global Mathematics. Quezon City: The Library Publishing House, Inc.

Melvin M. Callanta, Allan M. Canonigo , Arnaldo I. Chua , Jerry D. Cruz, Mirla S. Esparrago, Eleno S. Garcia , Aries M. Magnaye, Fernando B. Orines , Rowena S. Perez, Concepcion S. Ternida. (2015). Mathematics Learner’s Module.Pasig City : REX Book Store, Inc.

Melvin M. Callanta, Allan M. Canonigo , Arnaldo I. Chua , Jerry D. Cruz, Mirla S. Esparrago, Eleno S. Garcia , Aries M. Magnaye, Fernando B. Orines , Rowena S. Perez, Concepcion S. Ternida. (2015). Mathematics Teacher’s Guide .Pasig City : REX Book Store, Inc.

Quennie S. Flores,Manuel T. Kota, Eugenia V. Guerra.(2015).Math for the 21st Century Learners. Quezon City : Phoenix Publishing House, Inc.

For inquiries and feedback, please write or call:
 Department of Education – (Bureau/ Office)
 (Office Address) IPHO Bldg. Sudlon, Lahug, Cebu City
 Telefax: (032) 255 - 6405
 Email Address: cebuprovince@deped.gov.ph