

Name _____
Date _____

Introduction to Technical Mathematics
Class #09-A-2

Factoring - An Introduction

Quality - Accuracy - Transfer - 100%

Section 1. The "Horseshoe Method" for Listing Factors of a Number

1. List the Factors of 32: _____

32 _____

2. List the factors of 42: _____

42 _____

Section 2. Additional Practice and Application - The "Horseshoe Method".

3. Factors of 36

_____ a. Factors of 36 that add up to 12 _____
_____ b. Factors of 36 that subtract to 9 _____
_____ c. Factors of 36 that add to 13 _____
_____ d. Factors of 36 that subtract to 16 _____

4. Factors of 60

_____ a. Factors of 60 that add up to 16 _____
_____ b. Factors of 60 that subtract to 7 _____
_____ c. Factors of 60 that add to 32 _____
_____ d. Factors of 60 that subtract to 17 _____

5. Factors of 80

_____ a. Factors of 80 that add up to 21 _____

_____ b. Factors of 80 that subtract to 2 _____

_____ c. Factors of 80 that add to 24 _____

_____ d. Factors of 80 that subtract to 38 _____

6. Factors of 100

_____ a. Factors of 100 that add up to 25 _____

_____ b. Factors of 100 that subtract to 21 _____

_____ c. Factors of 100 that add to 20 _____

_____ d. Factors of 100 that subtract to 0 _____

Section 3. Greatest Common Factor - NORM!! FORM

NORM FORM is an algorithm (a mathematical process that can be repeated for success over and over again), that will yield the *Greatest Common Factor*, the *Least Common Multiple*, and *Reduce a Fraction* or any rational number to lowest terms. The drawback is that this method will work for two numbers at a time, only.

7. Find the *GCF*, the *LCM*, and Simplify the ratio between the numbers 28 and 42.

8. Find the *GCF*, the *LCM*, and Simplify the ratio between the numbers 108 and 144.

Section 4. Greatest Common Factor between Two Variable Expressions:

Characteristics of GCF: _____

2. State the Greatest Common Factor between the Following Pairs of Monomials.

a. x^2, x^3y _____ b. a^3b^2, a^2b _____

c. $6ab; -12a^2b^3$ _____ d. $8xy; 6xz$ _____

e. $7c^3d^3; -14c^2d$ _____ f. $50m^3n^2; 75m^3n$ _____

Section 5. Factoring Simple Expressions: Sums and Differences.

In each case, it must be noted that you are changing a sum or difference, or multi-termed expressions (a polynomial) to a product, by virtue of the act of "factoring". This will always be the case.

3. $2a + 2b$ _____ Check: _____

4. $bx - by$ _____ Check: _____

5. $15c - 10d$ _____ Check: _____

6. $p + prt$ _____ Check: _____

7. $\pi r^2 + \pi R^2$ _____ Check: _____

8. $10xy - 15x^2y^3$ _____ Check: _____

9. $28m^4n^3 + 70m^2n^4$ _____ Check: _____

Definition - Prime Polynomial: _____

10. Identify the Following as Prime. If they are not prime, then factor the expression.

2. $8m - 8n$ _____ Factor: _____

3. $3c + d$ _____ Factor: _____

4. $18a - 27b$ _____ Factor: _____

5. $5y^2 - 21x^2$ _____ Factor: _____

6. $\frac{1}{2}hb + \frac{1}{2}hc$ _____ Factor: _____

7. $21r^3s^2 - 12r^2s$ _____ Factor: _____

8. $15x^3y^3z^3 - 5xyz$ _____ Factor: _____

Section 6. The Factoring by Grouping - "Looking for the Key".

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

2. $3x(x - 2) - 4(x - 2)$

2. $x(x - 5) + 2(x - 5)$

4. $8x(2x - 1) + 3(2x - 1)$

5. $x(x - 1) - 5(x - 1)$

6. $3x(x + 1) + 2(x + 1)$

Section 7. FINALLY - Factor the Following Polynomial Expressions by "Grouping".

7. $x^2 + 5x + 2x + 10$

8. $x^2 + 4x + 3x + 12$

9. $x^2 - 6x + 2x - 12$

10. $x^2 - 7x + 3x - 21$

11. $x^2 + 7x - 2x - 14$

12. $x^2 + 8x - 3x - 24$

13. $x^2 - 10x - 8x + 80$

14. $x^2 - 6x - 4x + 24$

Section 8. Reverse F.O.I.L.

Section 1. Multiply the Given Expressions.

1. $(x + 7)(x + 3)$

2. $(x - 5)(x - 4)$

3. $(x + 7)(x + 3)$

4. $(x + 7)(x + 3)$

Section 2. Preparing to Factor Trinomials – The Story that the Signs Tell.

5. The General Form for Any 2nd Degree Trinomial. $ax^2 + bx + c$
- | | | | | |
|----|-----------------|-------|------------------|-------|
| a. | $ax^2 + bx + c$ | _____ | $x^2 + 5x + 6$ | _____ |
| b. | $ax^2 - bx + c$ | _____ | $x^2 - 7x + 10$ | _____ |
| c. | $ax^2 + bx - c$ | _____ | $x^2 + 8x - 9$ | _____ |
| d. | $ax^2 - bx - c$ | _____ | $x^2 - 10x - 24$ | _____ |

6. Factor the Following Expressions by “Reading Backward”.
- | | | | | |
|----|------------------|-------|------------------|-------|
| a. | $x^2 + 15x + 26$ | _____ | $x^2 + 13x + 12$ | _____ |
| b. | $x^2 - 8x + 12$ | _____ | $x^2 - 10x + 9$ | _____ |
| c. | $x^2 + 8x - 20$ | _____ | $x^2 - 13x - 30$ | _____ |
| d. | $x^2 + 7x - 18$ | _____ | $x^2 - 13x - 48$ | _____ |
| e. | $x^2 - 15x + 36$ | _____ | $x^2 + 13x + 30$ | _____ |

HW Section

Page(s)	Section(s)	Problem(s)
275 → 276	8.1	1 → 55 E.O.O.*
278 → 279	8.2	1 → 33 Odd

*E.O.O. - “Every Other Odd