Foundations of Math

Chapter 7 Packet

Part 1 - Polynomials

name:

Table of Contents

Name:_____ Notes #68

Adding Polynomials

Vocabulary:

Monomial -_____

Binomial – _____

Trinomial – _____

Polynomial – _____

Degree – _____

Leading Coefficient–_____

_____

Standard Form – _____

_____

Constant – _____

_____

Like terms – _____

_____

★A polynomial is in simplest form when it no longer contains any _____.

Ex) $5x^3 + 8x^2 - 5x^3 + 7 =$

Adding Polynomials: All you have to do is _____!

1) $(6x^2 + 3x + 7) + (2x^2 - 6x - 4)$

2) Find the sum of $(2p^3 + 6p^2 + 10p)\ and\ (9p^3 + 11p^2 + 3p)$

3) $(b^3 + 6b^2 - b) + (9b^2 - 7b^2 + 3b)$

4) The sum of $3x^2 + x + 8$ and $x^2 - 9$ is

5) The sum of $3x^2 + 4x - 2$ and $x^2 - 5x + 3$ is

6) What is the sum of $x^2 - 3x + 7$ and $3x^2 + 5x - 9$?

7) The sum of $4x^3 + 6x^2 + 2x - 3$ and $3x^3 + 3x^2 - 5x - 5$ is

8) What is the sum of $-3x^2 - 7x + 9$ and $-5x + 6x - 4$?

9) What is the sum of $2m^2 + 3m - 4$ and $m^2 - 3m - 2$?

Name:_____ Notes #69

SUBTRACTING POLYNOMIALS

Review:

1) What is a polynomial? _____

2) The sum of $4x^3 + 6x^2 + 2x - 3$ and $3x^3 + 3x^2 - 5x - 5$ is

3) What is the sum of $x^2 - 3x + 7$ and $3x^2 + 5x - 9$?

SUBTRACTING POLYNOMIALS:

"Subtracted From" _____

ex) What is 3 subtracted from 5?

"The Difference of" _____

ex) What is the difference of 10 and 4?

Examples:

1) $(3x^2 + 2xy + 7) - (6x^2 - 4xy + 3)$

2) $(x^2 - 5x - 2) - (-6x^2 - 7x - 3)$

3) When $5x + 4y$ is subtracted from $5x - 4y$, the difference is

4) When $3g^2 - 4g + 2$ is subtracted from $7g^2 + 5g - 1$, the difference is

5) The expression $(2x^2 + 6x + 5) - (6x^2 + 3x + 5)$ is equivalent to

6) When $4x^2 + 7x - 5$ is subtracted from $9x^2 - 2x + 3$, the result is

7) When $3a^2 - 2a + 5$ is subtracted from $a^2 + a - 1$, the result is

8) If $2x^2 - 4x + 6$ is subtracted from $5x^2 + 8x - 2$, the difference is

Name:_____ Notes #70

Exponent Rules

Exponent – _____

_____

ex) $3^3 =$ ex) $(4x^3)^4 =$

Product Rule – _____

_____

ex) $x \cdot x^3 =$ ex) $5x^2 \cdot 2x^5 =$ ex) $(2^3)(2^5) =$

Power to a Power Rule – _____

_____

ex) $(3x^5)^2 =$ ex) $(2x^3)^5 =$

Quotient Rule – _____

_____

ex) $\frac{y^5}{y^2} =$ ex) $\frac{8x^{10}}{2x^3}$ ex) $\frac{4^8}{4^3} =$

Rewriting Negative Exponents – _____

_____

Ex) $\frac{x^2}{x^5} =$ ex) $\frac{x^3}{x^8} =$ ex) $\frac{2x^5}{6x^9} =$

Use the laws of exponents to simplify.

1) $x^3 \cdot x^4 \cdot x^5 =$ **2)** $(y^2)^5 =$

3) $(3y^5)2 =$ **4)** $\frac{-20x^4}{5x} =$

5) $\frac{(x^5)(x^5)}{(x^2)^4} =$

6) $2x^2(7x^7 + 3x^2) =$

7) What is 2^4 equivalent to?

8) What is $(2x)^4$ equivalent to?

a) $8x$ b) $16x^4$ c) $8x^4$

9) What is $(3x)(4x^2)$ equivalent to?

a) $12x^3$ b) $12x^2$ c) $7x$

10) What is $3x(x + 4)$ equivalent to?

a) $3x^2 + 4$ b) $3x^2 + 12x$ c) $3x + 12$

11) What is $\frac{27x^8}{3x^2}$ equivalent to?

a) $9x^6$ b) $9x^4$ d) $9x^{10}$

Name:_____ Notes #71

Multiplying Monomials

Review:

1. $(3n^4)^2$ 2. $v^{-3} \cdot v^2 \cdot v^6$ 3. $6x^2 \cdot 4x^{10}$

When multiplying monomials, we will _____ the _____

and then _____ the _____.

For each problem, a) simplify, and b) give the degree, c) the leading coefficient, and d) what it is called:

Example A. $-3x^2(x^2 - 3x)$

Example B. $4b(5b^2 - b + 6)$

1. $8m(m + 6)$
2. $-4m(-m + 2)$
3. $9b^4(2b^4 - 3b + 10)$
4. $-3g^7(g^4 - 6g^3 + 5)$
5. $-5w^2(9w^2 - 8w - 5)$
6. $12r(2r^6 - r + 2)$

7. $4(2x^2 + 6x - 5)$

8. $5z(2z^2 - 6z + 3)$

9. $2(7n^2 + 5n + 8)$

10. $5d^3(8d^2 + 2d + 3)$

11. $4k(7k^2 + 6k + 3)$

12. $2g(3g + 6)$

13. $8x(3x + 7)$

14. $7p^2(4p^2 + 3p - 3)$

Name:_____ Notes #72

Multiplying Binomials

Review: Distribute, find the degree, leading coefficient, and type of polynomial:
$4x^3(3x^2 + 5x - 7)$

Now let's multiply a binomial by a binomial: $(\mathbf{2x + 3})(\mathbf{3x + 4})$

In order to multiple binomials together, we have to multiple _____

in the first binomial to _____ term in the second binomial.

This is called _____.

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

A neat, simple way to do this is by using the _____.

Multiply the binomials. For each problem, a) simplify, b) give the degree, and c) give the leading coefficient.

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

2) $(2y - 3)(4y - 5)$

3) $(x+y)^2$

4) $(2x+1)(4x+3)$

5) $(6x-11)(x+2)$

6) $(d+9)(d-11)$

7) $(b+8)(2b-5)$

8) $(x-3)^2$

9) $(2x^2+1)(x-1)$

Name:_____ Notes #73

MULTIPLYING POLYNOMIALS

Review: a) Simplify, b) give the degree, and c) the leading coefficient, and d) what it is called

$(5x + 7)(2x + 3)$

Using the _____ we can also multiply ANY types of polynomials!
For each problem, a) simplify, b) give the degree, c) the leading coefficient, and d) what it is called:

1) $(x + 2)(x^2 + 3x - 8)$

2) $(x - 3)(x^2 - 4x + 6)$

3) $(x^2 + 3x + 3)(x - 2)$

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

5) $(a^2 + 3a - 5)(a^2 + 6a + 1)$

6) $(2x^2 - 6x + 3)(x^2 + 5x - 1)$

7) $(x + 2)(3x^2 - 5x + 2)$

Name:_____ Notes #74

GCF Practice

To find the GCF of monomials, we have to list the _____ of each monomial and _____ the factors that they have in common.

1. Find the GCF of **6** and **15**

6:

15:

2. Find the GCF of **18** and **3**

3. Find the GCF of **65** and **91**

4. Find the GCF of **8**, **16** and **24**

HOW TO QUICKLY FIND THE GCF OF TWO NUMBERS USING YOUR CALCULATOR

Step 1: Press MATH
Step 2: Use the arrows to scroll to the right so that NUM is highlighted
Step 3: Press the number 9
Step 4: Type in your TWO numbers, with a comma in between.
Step 5: Press ENTER

To find the GCF, ask yourself "What is the _____ number that goes into both numbers and the _____ exponent that goes into each variable.

5. Find the GCF of **x** and **x^2**

6. Find the GCF of **x^3y^2**, **yx^2** and **xy**

7. Find the GCF of **6xz** and

$15x^2yz$

8. Find the GCF of **$18ab^3c$** and **3ba**

9. Find the GCF of **$2xy$** and **$4x$**	**10.** Find the GCF of **$4x^2$** and **$24x$**
11. Find the GCF of **$9h^6k^7$** of **$81h^8k^5$**	**12.** Find the GCF of **$14g^3f^3$** and **$49hf^{16}g$**
13. Find the GCF of **$7x^2$** and **$4x^2$**	**14.** Find the GCF of **$16x^3y^2$** and **$4y^2x^3$**

Name:_____ Notes #75

Factoring out a GCF

Review: Distribute.

$3a(2a + 1)$

Once you identify the GCF of monomials, you can _____.

Factoring is the exact opposite of _____.

Distributing = _____, so Factoring = _____.

1) $6a^2 + 3a$

Factoring a GCF Steps:

1. Identify the _____.
2. Write the _____ in front of the _____.
3. _____ each term from the question by the _____.
4. Write the answers you get when dividing in the _____ in order.
   *Don't forget about the $+/-$ signs! They stay in between the terms where they started.

2) $10d^4 + 30d^3$

3) $12d^4 + 42d^3 - 18d^2$

4) $16d^4 + 16d$

5) $6d^5 + 10d^3 - 21d^2$

6) $20d^5 + 4d^4 - 8d^3$

7) $18d^3 + 12d$

8) $2\text{vm}^2 - 14\text{vm}$

9) $24r^3 + 116r^2 - 168r$

Name:_____ Notes #76

Difference of Perfect Squares

Review: Factor a GCF out of the following

1.) $3m^4 + 12m^3 - 9m^2$

2.) $4x^2 + 2x$

Sometimes, if you have _____ terms, if can be factored using a special rule called _____.

We can use _____ when there are _____ terms separated by a _____ sign and all

_____ and _____ are _____.

List the Perfect Squares:_____

_____

1.) $x^2 - 9$

2.) $x^2 - 16$

2.) $x^2 + 16$

4.) $m^2 - 25$

5.) $b^2 - 100$

6.) $x^3 - 36$

7.) $4x^2 - 25$

8.) $36 - y^2$

9.) $144a^2 - 16b^2$

10.) $49m^4 - 36n^2$

11.) $81b^2 - 100$

12.) $25m^2 + 4$

Name:_____ Foundations Homework 76

Factor the Difference of Perfect Squares. Choose 4 problems to do. Do all of the problems for Extra Credit.

1.) $x^2 - 25$

2.) $x^2 - 49$

3.) $x^2 + 4$

4.) $36 - m^2$

5.) $81a^2 - b^2$

6.) $121m^2 - 9w^2$

7.) $144 - 16m^2$

8.) $64p^4 - 4q^2$

9.) $36h^2 - 100$

10.) $144w^4 - 1$

11.) $81 - b^6$

12.) $100a^2 - 16$

Name:_____ Foundations Homework 75

Find the GCF of the terms and then factor it out.

1.) $3x + 3$

2.) $x^2 - x$

3.) $36t^4 + 24t^2$

4.) $9x^4 + 6x^3 + 18x^2$

Name_____ Foundations Homework 74

Find the GCF of each pair of monomials

1) $5x$ and $15x^3$

2) $4xy$ and $6x^2y^2$

3) $10x^5yz$ and $20x^4y^2z$

Name_____ Foundations Homework 73

Multiply the polynomials using the Box Method.

1) $(x-1)(x^3+6x^2-5)$

2) $(2x^2+10x+1)(x^2+x+1)$

Name_____ Foundations Homework 72

Multiply the binomials using the Box Method. Write you answer in Standard Form.

1. $(4n + 1)(2n + 6)$

2. $(x - 3)(6x - 3)$

Name_____ Foundations Homework 71

For each problem, a) simplify into standard form, b) give the degree, and c) give the leading coefficient

1) $3r(7r-8)$

Degree:

Leading Coefficient:

2) $10a(a^2-10a)$

Degree:

Leading Coefficient:

3) $3n(n^2-6n+5)$

Degree:

Leading Coefficient:

4) $2k^3(2k^2+5k-4)$

Degree:

Leading Coefficient:

Name:_____ Foundations Homework 69

Simplify. Write you answer in Standard Form.

1) $(3x^2 - 2x + 1) - (2x^2 + 7x + 5)$

2) $(-2x^2 + 4x + 2) - (x^2 + 6x - 4)$

3) If $2x^2 - x + 6$ is subtracted from $x^2 + 3x - 2$, the result is

4) When $3a^2 - 7a + 6$ is subtracted from $4a^2 - 3a + 4$, the result is

Name:_____ Foundations Homework 68

Simplify. Write your answer in standard form.

1) What is the sum of $-3x^2 - 7x + 9$ and $-5x^2 + 6x - 4$?

2) The sum of $3x^2 + 5x - 6$ and $-x^2 + 3x + 9$ is

3) $(x^2 + y^2 + 8) + (4x^2 - 2y^2 - 9)$

4) $(4x - 7) + (x + 5y + 1)$