Unit 1: Polynomials and Factoring Quadratics

**By the end of the unit students will be able to:**

1) Factor quadratic binomial, trinomial, and polynomials of 4 terms.

2) Solve quadratic equations by factoring.

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| **Day** | **Date** |  **Lesson** | **Assignment** |
| 1 | Mon. Aug. 28th  | Introductions and ExpectationsAdding/Subtracting Polynomials | Complete Calculator Agreement/Honor Code Forms |
| 2 | Tues. Aug. 29th  | Multiplying Polynomials | Homework 1-2 |
| 3 | Wed. Aug. 30th  | Intro to Factoring: GCF, X-Box | Homework 1-3 |
| 4 | Thurs. Aug. 31st  | More Factoring: Difference of Squares | Homework 1-4 |
| 5 | Fri.Sep. 1st  | **Review and Quiz** | NO HOMEWORK |
| 6 | Mon. Sep. 4th  | Labor DayNo School ☺ | NO HOMEWORK |
| 7 | Tues.Sep. 5th  | Solve by Factoring | Homework 1-5 |
| 8 | Wed. Sep. 6th  | Solve by Factoring Practice | Finish Worksheet |
| 9 | Thurs.Sep. 7th  | Review for Unit 1 Test | Review for Test |
| 10 | Fri. Sep. 8th  | Test | NO HOMEWORK |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class: \_\_\_\_\_\_\_\_\_**

**Math 2 - Unit 1 Notes and Homework Packet**

**Day 1: Adding and Subtracting Polynomials**

**Polynomial: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**When adding and subtracting polynomials, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Example: $\left(4x^{3}+5x^{2}-2x+1\right)+\left(6x^{3}+x^{2}-9\right)$ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. $\left(3w^{3}-8w^{2}+w-2\right)-\left(4w^{3}+5w^{2}+2w-1\right)$ 2. $\left(-2p^{2}+12p+3\right)+\left(7p^{2}-p-4\right)$

3. $\left(-7c^{2}+2c-3\right)-\left(-5c^{2}+7c-3\right)$ 4. $\left(9d^{3}-3d+7\right)+\left(4d^{3}-2d^{2}+6d+11\right)$

5. $\left(4x^{2}+13x-2x^{3}+5x-14\right)-\left(5x^{2}+6x^{3}+10-7x+4\right)$

**Let’s step it up a notch!**

Example: $\left(4x^{2}y+3xy- 4xy^{2}\right)+ \left(6x^{2}y-2xy+ 9xy^{2}\right)= $\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. $\left(2z^{2}-9zy+5y^{2}\right)-\left(8z^{2}+zy+2y^{2}\right)$ 7. $\left(6r^{2}-9rs^{2}+5s^{2}+2\right)+\left(7rs^{2}-2r^{2}-10\right)$

8. $\left(3a^{3}+2ab^{2}+2b^{2}\right)+\left(b^{2}-5ab^{2}+4a^{2}\right)$ 9. $\left(6g-gk+6k^{2}-9g^{2}\right)-\left(7g^{2}+3k^{2}-8gk\right)$

10. $\left(4x^{2}y-3xy+2x^{2}+4y+1\right)+\left(9x^{2}+x^{2}y-9y-13\right)$

**Day 2: Multiplying Polynomials**

**When multiplying polynomials, use the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**Multiply the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**If any terms have the same variables, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the exponents.**

Example: $\left(2x^{2}+4x-1\right)\left(3x+4\right)= $**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. $(2x-6)(7x+1)$ 2. $(3x-1)(2x^{2}+3x)$

3. $3x²(4x^{3}-5x+10)$ 4. $(x+5)(x^{2}-6x+3)$

5. $(2x-3)(4x^{2}+8x-2)$ 6. $(5x^{2}+4x-1)(3x^{2}-x+4)$

**Let’s step it up a notch!**

Example: $(6x+3y)(x-5y)$ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. $(5x-2y)(x+7y)$ 8. $(3x –8y)(3x+8y)$

9. $(4x-y)(2x-3y+2)$ 10. $(-5x+y)(3x+2y-8)$

11. $(3x+2y-4)(x-5y+9)$ 12. $(3x^{2}-xy+ y^{2})(4x+7y-1)$

**Homework 1.2**

**Multiply the following polynomials.**

1. $(4x-3)(x+1)$ 2. $(8+x)(5x+5)$ 3. $(2x^{2}-3x)(x-10)$

4. $(x+4y)(x-2y)$ 5. $(7x^{2}-2x+1)(x-2)$ 6. $(x^{2}+8x-2)(3x+8)$

7. $(5x^{2}+3y)(4x-y)$ 8. $(3x^{2}-2xy+ y^{2})(x-7y+1)$

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**Day 3: Intro to Factoring**

**GCF - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ -** Factor out what the terms have in common

Factor out the GCF and write what is left over.

1. $4x – 10$ 2. $6a^{2} + 8b$ 3. $12xy^{2} – 16x^{3}y$

 4. $25ab + 15c$ 5. $16x^{3}y + 14xy^{2} – 10x^{2}$ 6. $24a^{4}b^{2}cd^{2} – 16a^{3}bc^{5}d$

**Factoring by using the X-Box (leading coefficient = 1)** – Use when factoring a trinomial (\_\_\_\_ terms)

1. $x^{2} + 9x + 14$ 2. $s^{2} + 5s – 24$
2. $a^{2} – 24a – 25$ 4. $x^{2} – 9x + 18$
3. $h^{2} – 23h+90$ 6. $d^{2}+19d-42$

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**Homework 1.3**

**Factor out the GCF and write what is left over**

1. $4x^{2} – 6xy$ 2. $3ab^{2} + 9a^{4}b^{2}$ 3. $14x^{2}y^{2} – 7xy^{3} + 28x^{4}y$

**Factor using the X-Box**

1. $y^{2} – 9y – 22$ 5. $p^{2} + 20p – 125$ 6. $t^{2} – 2t – 35$
2. $w^{2} + 14w – 51$ 8. $x^{2} + 14x+ 45$ 9. $c^{2} – 49$

**Day 4: Factoring with a leading coefficient ≠ 1 and difference of squares**

**Review from yesterday: Factoring with a leading coefficient = 1**

1. $x^{2} – 10x – 200$ 2. $x^{2}+7x+6$

\* When factoring a trinomial with a leading coefficient ≠ 1, make sure you\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the first and last coefficients.

1. $3x^{2} – 14x – 5$ 4. $36x^{2} – 13x + 1$
2. $7a^{2} + 20a + 12$ 6. $10b^{2} + 3b – 4$

**Difference of Squares**

**\*TRICK** – take the square root of both terms and separate them into different binomials (one + and one -)

1. $x^{2} – 25$ 8. $x^{2} – 121$ 9. $9x^{2} – 64y^{2}$

**Homework 1.4**

1. $4x^{2} + 7x + 3$ 2. $6n^{2} + 25n + 14$ 3. $20a^{2} – 21a – 5$
2. $3x^{2} – 6x – 24$ 5. $4x^{2} – 100$ 6. $81x^{4} – 16$

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**Day 5: Solve equations by factoring**

**Review: factoring with and without a leading coefficient of 1**

1. $x^{2} – 25x + 24$ 2. $20a^{2} + 17x + 3$

**Solving Equations by Factoring**

1. $x^{2} – 25x + 24 = 0$ 🡪 We already know that the factors are \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_

so \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = 0, which means that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = 0 and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = 0.

So, the answers are x = \_\_\_\_\_\_\_\_\_\_\_\_\_ and x = \_\_\_\_\_\_\_\_\_\_\_\_\_.

1. $3x^{2} + 29x – 10 = 0$ 3. $5x^{2} – 4x – 9 = 0$
2. $x^{2} + 3x = 18$ 5. $2x^{2} + 9 = 17x$

6. $36x^{2} – 4 = 0$ 7. $ 6x^{2} = 21x – 9$

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**Homework 1.5**

**Solve each equation**

1. $x^{2} + 3x – 18 = 0$ 2. $ 2t^{2} – 29t + 45 = – 5$ 3. $16g^{2} = 100$
2. $7q^{2} = 62q + 9$ 5. $12n^{2} + 4 = 14n$ 6. $400x^{2} + 58x + 1 = 0$