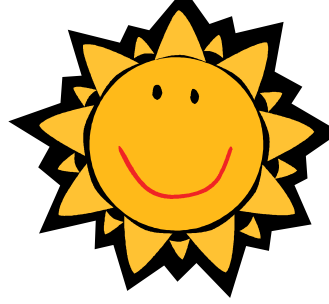


Unit 2 Day 2

Factoring and Solving

Warm Up



Factor the following

1. $x^2 + 13x + 40$

$(x + 8)(x + 5)$

2. $4x^2 - 100$

$4(x + 5)(x - 5)$

3. $x^2 + 5x - 6$

$(x + 6)(x - 1)$

4. $x^2 - 5x - 14$

$(x - 7)(x + 2)$

5. $2x^2 - 8x$

$2x(x - 4)$

6. $-3x^3 + 12x$

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

Homework Answers

Packet p. 1 and 2 #1-9, #19-20

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

2. $(y - 10)(y - 10)$ OR $(y - 10)^2$

3. $(m - 8)(m - 1)$

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

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

6. $(k + 8)(k - 3)$

7. $(x - 9)(x - 4)$

8. Prime (Not Factorable)

9. $(p - 6)(p + 2)$

19. $5(x - 4)(x + 3)$

20. $4(x + 1)(x - 1)$

Homework Answers

Packet p. 2 #21-24

21. $7, 8, 13, -7, -8, -13$

22. $x^2 - 10x - 21$ and $9x^2 - 144$

Continued...(Students you may have a variety of answers for this question, the ones given are examples of what was being asked by the question)

23. a) $x^2 - 3x - 54$

b) $x^3 - 18x^2 + 108x - 216$

c) $x^3 + 12x^2 + 48x + 64$

d) $3x^2 - 363$

e) $x^3 - 28x + 48$

24. a. $3x^3 + 2x^2 - 6x + 14$

b. $7x^3 - 23x^2 - 6x + 24$

Notes p. 4 Top Half

$$1) x^2 + 4x + 4$$

$$(x + 2)(x + 2)$$

$$3) x^2 - 6x + 9$$

$$(x - 3)(x - 3)$$

$$5) x^2 - 11x + 30$$

$$(x - 5)(x - 6)$$

$$7) x^2 + 3x - 18$$

$$(x - 3)(x + 6)$$

$$9) x^2 - 9$$

$$(x + 3)(x - 3)$$

$$2) x^2 + 5x + 6$$

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

$$4) x^2 - 7x + 12$$

$$(x - 3)(x - 4)$$

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

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

$$8) x^2 - 2x - 15$$

$$(x - 5)(x + 3)$$

$$10) x^2 - 16$$

$$(x + 4)(x - 4)$$

Notes p. 4 Top Half

$$11) 3x^2 + 18x + 15$$

$$3(x + 5)(x + 1)$$

$$13) 3x^2 + x$$

$$x(3x + 1)$$

$$15) 9x^2 - 36$$

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

$$17) x^3 - 5x^2 - 3x + 15$$

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

$$12) 4x^2 - 24x + 20$$

$$4(x - 5)(x - 1)$$

$$14) 5x^3 - 5x$$

$$5x(x - 1)(x + 1)$$

$$16) x^3 - 3x^2 + 2x - 6$$

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

$$18) -20x^3y^2 - 10xy - 25x^2y$$

$$-5xy(4x^2y + 2 + 5x)$$

Tonight's Homework

- Packet p. 3 #2-18 even, 19-24 all Complete Notes p. ~~9~~ 6
- Unit 2 Quiz #1 is coming on Friday!
 - Make sure to STUDY!!



Notes p. 4:

Review from Math 1:

Graph the equation $y = x^2 + 13x + 40$ on your calculator.

Use your calculator to find the zeroes: $x = \underline{-5}$ and $x = \underline{-8}$

From the warm-up, the factors of $y = x^2 + 13x + 40$ are
 $(x + 5)(x + 8)$.

Set each factor equal to zero and solve for x .

$$x + 5 = 0$$

$$x = -5$$

$$x + 8 = 0$$

$$x = -8$$

What do you notice about your answers and the zeroes you found earlier on your calculator? **They are the same! 😊**

Summary:

To solve a quadratic with your calculator

- Enter the equation into “y =” and use the “zero” function. (You did this in Math 1)
- When you set ‘y=0’ and the other expression equal to y, what are we trying to find?
- What does the intersection of two lines mean? How does this connect to factoring?
 - You can use a table or a graph (intersection tool) when using the calculator to determine an intersection.

To solve a quadratic algebraically (this is new)

- Set the equation equal to zero by using the Zero Product Property
- Factor the equation
- Set each factor equal to zero and solve

- Example 1: Solve $x^2 + 8x = -12$

$$x = -2, -6$$

- Example 2: Solve $5x^2 - 4 = x - 4$

$$x = 0, 1/5$$

Practice

Solve each quadratic algebraically. Check your answers using the zero function on your calculator.

$$1) x^2 + 4x = -4$$

$$x = -2$$

(double root)

$$2) x^2 + 5x = -6$$

$$x = -3, -2$$

$$3) x^2 + 9 = 6x$$

$$x = 3$$

(double root)

$$4) 3x^2 = -6x$$

$$x = 0, -2$$

Day 2: Factoring when $a \neq 1$ (Busting the “B”)

What if the problem has “a” value that is not equal to 1?

For example, $4x^2 + 8x + 3 = 0$:

How can we algebraically find where this graph = 0?

The concept of *un-distributing* is still the same!!

$$4x^2 + 8x + 3 = 0$$

In this case we need to find out what multiplies to give us $a \bullet c$ but adds to give us b .

Let's list all the factors of $4 \bullet 3$ or 12 :

$$\begin{array}{l} 1 \bullet \underline{12} \\ 2 \bullet \underline{6} \\ 3 \bullet \underline{4} \end{array}$$

Which one of those sets of factors of 12 also add to give us the b value, 8?

- 1 • 12
- 2 • 6
- 3 • 4

Rewrite the original equation using an equivalent structure:

$$4x^2 + 8x + 3 = 0$$

$$4x^2 + 6x + 2x + 3 = 0$$

$$(4x^2 + 6x) + (2x + 3) = 0$$

$$2x(2x + 3) + 1(2x + 3) = 0$$

$$(2x + 1)(2x + 3) = 0$$

Remember!! It doesn't matter which order you write the factors in!

Group the first two and last two!

Undistribute what is common to both terms

Create factors out of the repeated factor, and the undistributed factors

Use multiplication (box, distribution, or FOIL) to check that it is equal to what you started with!

Practice

Solve **by factoring**.

$$1) 2x^2 + 5x + 3 = 0$$

$$x = -1, -3/2$$

$$2) 2x^2 + 9x + 10 = 0$$

$$x = -5/2, -2$$

$$3) 3x^2 + 18x + 15 = 0$$

$$x = -1, -5$$

$$4) 3x^2 + 13x = 10$$

$$x = 2/3, -5$$

Solve by taking Square Root

Examples

$$5) x^2 - 144 = 0$$

$$x = 12, -12$$

$$6) x^2 - 28 = 0$$

$$x = 2\sqrt{7}, -2\sqrt{7}$$

$$7) 2x^2 - 150 = 0$$

$$x = 5\sqrt{3}, -5\sqrt{3}$$

$$8) 3x^2 + 27 = 0$$

$$x = 3i, -3i$$

Solve Quadratics Practice!

- **Notes Page 6** – Show all work!



- If you finish with this page with time to spare, begin working on problems 10-18 on Packet Page 1

Practice p. 6 **Answers**

$$1. x^2 + 5x - 24 = 0$$

$$x = -8, 3$$

$$2. x^2 - 3x - 28 = 0$$

$$x = 7, -4$$

$$3. 3x^2 + 16x - 12 = 0$$

$$x = -6, \frac{2}{3}$$

$$4. 4x^2 + 3x = 0$$

$$x = 0, -\frac{3}{4}$$

$$5. 4x^2 + 7x - 2 = 0$$

$$x = \frac{1}{4}, -2$$

$$6. 9x^2 + 30x + 24 = 0$$

$$x = -\frac{4}{3}, -2$$

$$7. 24x^2 + 132x = 0$$

$$x = 0, -\frac{11}{2}$$

Practice p. 6 **Answers**

$$8. x^2 = 81$$

$$x = 9, -9$$

$$9. x^2 = 25$$

$$x = 5, -5$$

$$10. 5x^2 - 20 = 0$$

$$x = 2, -2$$

$$11. 5x^2 + 5 = 0$$

$$x = i, -i$$

$$12. 6x^2 - 72 = 0$$

$$x = \pm\sqrt{12} = \pm 2\sqrt{3}$$

$$13. 3x^2 - 9 = 0$$

$$x = \sqrt{3}, -\sqrt{3}$$

$$14. 2x^2 + 72 = 0$$

$$x = 6i, -6i$$

Tonight's Homework

- Packet p. 3 #2-18 even, 19-24 all
Complete Notes p. ~~9~~ 6
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