

This is the beginning!
Here we go..!

7.4

Your Name

Mrs. T

3/1/21

Notes

Zero Product Property

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Objective: To be able to solve a factored polynomial by applying the zero product property.

Life Lesson/Skill: This is the last step in solving any polynomial. We will be learning how to factor and turn polynomials into factored form. Once we can do that, we will use the skills we learn to today to finish them off. Like when you brush your hair, you start at the ends and get the tangles sorted out before you work from the top of the head.

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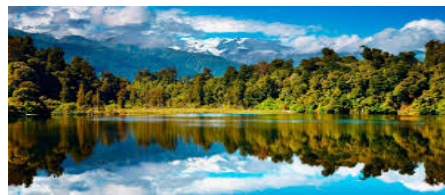
It is the simple things in life. . . .

The Zero Product Property

Anything times 0 equals 0

$$a(0) = 0 \quad (0)b = 0$$

if $ab = 0$ then **either b was 0 or a was 0**



$$a \cdot 3 = 0 \quad 5 \cdot b = 0$$

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This fun fact is how we are going to solve for a squared variable!

$$x^2 + 2x + 1 = 0$$

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Solving a Quadratic Equation w/ Zero Product Property

Quadratic equations are ones where the highest degree/power is 2. x^2

Once we have found two or more things that are all multiplied and equal 0, one or all of those factors could equal 0. So we set each factor equal to 0 and solve for the variable.

ex. $(x+2)(x-5) = 0$

$$\begin{array}{l} x+2=0 \\ -2 \quad -2 \\ \hline x=-2 \checkmark \end{array} \quad \begin{array}{l} x-5=0 \\ +5 \quad +5 \\ \hline x=5 \end{array}$$

Check: $(-2+2)(-2-5) = 0$
 $(0)(-7) = 0 \checkmark$

ex. $(4x-8)(-5x+7) = 0$

$$\begin{array}{l} 4x-8=0 \\ +8 \quad +8 \\ \hline 4x=8 \\ \frac{4x}{4} = \frac{8}{4} \\ x=2 \end{array} \quad \begin{array}{l} -5x+7=0 \\ -7 \quad -7 \\ \hline -5x=-7 \\ \frac{-5x}{-5} = \frac{-7}{-5} \\ x=\frac{7}{5} \end{array}$$

$(5+2)(5-5) = 0$
 $7(0) = 0$
 $0 = 0 \checkmark$

ex. $6x(x-10)(x+21) = 0$

$$\begin{array}{l} 6x=0 \\ x=0 \end{array} \quad \begin{array}{l} 4x-10=0 \\ +10 \quad +10 \\ \hline 4x=10 \\ \frac{4x}{4} = \frac{10}{4} \\ x=\frac{5}{2} \end{array} \quad \begin{array}{l} x+21=0 \\ -21 \quad -21 \\ \hline x=-21 \end{array}$$

ex. $x(x-3)(x+9) = 0$

$$\begin{array}{l} x=0 \\ x-3=0 \\ +3 \quad +3 \\ \hline x=3 \end{array} \quad \begin{array}{l} x+9=0 \\ -9 \quad -9 \\ \hline x=-9 \end{array}$$

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Solve each equation. Check your solutions, there could be more than 1!

Board Work!

~~$3m + 36 = 0$~~

$3(m + 6) = 0$

Check

~~$5x^2 - 35x = 0$~~

$5x(x - 7) = 0$

$5x=0 \quad x-7=0$
 $x=0 \quad x=7$

~~$4p^2 = -16p$~~

$4p(p+4) = 0$

Check

~~$4a^2 + 28a + 9a - 63 = 0$~~

$(a + 7)(4a - 9) = 0$

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Summary

Objective: To be able to factor a polynomial by taking out the GCF. To be able to factor a four term polynomial by grouping. To be able to solve an equation by factoring.

Virtue/Skill: We are using our skills of finding GCF with monomials to factor out the GCF. This is the first step to factoring anything. This must happen first. We are also getting the foundations to factoring cubic equations that have 4 terms. We are using our knowledge of the zero product property to solve equations.

Assignment: pg. 381 #9-20 odd

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Homework Key

pg. 381 #9-20 odd

$$9. a = 3, a = -5$$

$$10. q = -\frac{3}{4}, q = -2$$

$$11. m = -\frac{4}{5}$$

$$12. h = 8$$

$$13. g = \frac{3}{2}, g = 7$$

$$14. d = \frac{1}{2}, d = -\frac{1}{2}$$

$$15. z = 0, z = -2, z = 1$$

$$16. p = 0, p = \frac{3}{2}, p = -7$$

$$17. r = 4, r = -8$$

$$18. w = 0, w = 6$$

$$19. c = 3, c = -1, c = 6$$

$$20. n = 2, n = -9$$