Pre-AP Algebra 2 Unit 4 - Lesson 1 - Solving Quadratic Equations by Factoring

Objectives: In this activity, the students will review the Zero–Product Property and use it and their factoring skills to solve quadratic equations.

Materials: DO NOW; pairwork; homework 4-1

Time	Activity
	DO NOW:
	My Favorite No – Display the 3 questions and have students answer them on notecards. Collect notecards
	to see where students are on solving by factoring. Choose the "best" wrong answer to discuss.
	Solve for <i>x</i> :
	(1) $2x - 16 = 0$
	(2) $2x^2 - 16x = 0$
	$(3) 2x^2 - 16x + 24 = 0.$
	Solutions:
	(1) x = 8
	(2) $x = 8$ and $x = 0$
	(3) $x = 6$ and $x = 2$
	Activity
	Activity:
	• Determine how many students got both answers in problem #2 and use this to start a discussion about
	• Determine now many students got both answers in problem #2 and use this to start a discussion about division by a variable do not divide both sides of an equation by a variable because the variable may
	division by a variable – do not divide both sides of an equation by a variable because the variable may
	be zero. Define division as $\frac{a}{-} = c$ if and only if $bc = a$ and have students explain why division by
	b
	zero is "undefined."
35 min	Direct Instruction
	• Review the Zero–Product Property of Equality. Make sure students substitute to check their answers.
	1. $(x+2)(2x-3) = 0$
	2. $x(x+2) = 0$
	3. $x(x+2) = 8$
	• Review the use of <i>and</i> and <i>or</i> in determining the solution sets in compound sentences. Compare the
	solution for problem #2 with the solution to the problem $x(x + 2) = 8$ solved incorrectly as $\{8, 6\}$. Have
	students substitute solutions to check answers and discuss why there is no Eight Product Property of
	Equality of any other number except zero.
	• Have students develop the steps for solving an equation by factoring: Step 1: Write in Stendard Form (Isolate zero)
	Step 2: Factor
	Step 2. Factor Step 3: Use the Zero, Product Property of equality
	Step 5: Ose the zero-robuter roberty of equality Step 4: Find the solutions
	Step 5. Check
	• Remind students that to solve by factoring your equation must be set equal to zero first Wby?
	$4 r^2 + 6r = -9$ This is an example of multiplicity – same answer appears more than once
	5. $3x^2 - 8x + 20 = 2x^2 + 5$
	6. $7x^2 + 9x + 3 = 2x^2 + 5$

Solve for x:
(1)
$$2x - 16 = 0$$

(2) $2x^2 - 16x = 0$
(3) $2x^2 - 16x + 24 = 0$.

- 1. $x^2 + 10x + 16 = 0$ 2. $x^2 25 = 0$ 3. $x^3 3x^2 = 0$ 4. $6x^2 + x = 35$ 5. $x^3 x^2 = 6x$ 6. $3x^4 + 3x^3 = 6x^2 + 6x$ 7. $3x^4 + 15x^2 = 72$ 8. $x^4 + 7x^3 = 9x^2 + 63x$
- 9. $28x^4 + 8 = 10 4x^4$ 10. $4x + 45 = 18x^2 + 7x$
- 11. The perimeter of a rectangle is 50 in. and the area is 144 in². Find the dimensions of the rectangle.
- 12. A concrete walk of uniform width surrounds a rectangular swimming pool. Let x represent this width. If the pool is 6 ft. by 10 ft. and the total area of the pool and walk is 96 ft^2 , find the width of the walk.

13. The longer leg of a right triangle has a length 1 in. less than twice the shorter leg. The hypotenuse has a length 1 in. greater than the shorter leg. Find the length of the three sides of the triangle.