Stephanie Miller

Solving Quadratics Using Quadratic Formula

Length: 30 minutes plus 15 minutes for worksheet

Grade: 9th Grade Algebra

Academic Standard: A1.8.6 | Solve quadratic equations by using the quadratic formula.

Performance Objectives: Given any quadratic equation, the Algebra I students will be able to correctly solve the equation for x using the quadratic formula with 90% accuracy.

Assessment: An in-class worksheet of quadratic equations will be completed using the quadratic formula by the students with 90% accuracy.

Advance Preparation by Teacher:

1. Copy worksheets for students
2. Make key for worksheet
3. Load YouTube link on computer

Procedure:

Introduction/Motivation: I will remind students they have been learning how to solve quadratic equations by graphing and factoring. I will ask them, "What happens if the equation cannot be factored and it crosses the x-axis in-between two whole numbers? How do you find the solutions?" I will then tell them that they today will be learning the quadratic formula which always gives you the solutions. I would then show them the Quadratic Formula Song on YouTube (Gardner: Musical). http://wwwc.youtube.com/watch?v=j-hrP_9vx5o&feature=related

Step by Step Plan:

1. Have the students sit down in their assigned seats and get out their notebooks.
2. Have a student tell me the general form of a quadratic equation in terms of a, b, and c ($0 = ax^2 + bx + c$). Write this on the board.
3. Write and label the quadratic formula on the board, while singing to the tune of the Quadratic Formula Song. Explain that the a, b, and c in the first equation are the same a, b, and c in the second equation.
4. Write on the board a quadratic equation ($0 = 4x^2 + 4x - 3$). Ask a student to identify which coefficient is a, b and c (Bloom: Knowledge).
5. Tell students to plug these numbers into the Quadratic Formula. Simplify to $x = \frac{1}{2}$ or $x = -\frac{3}{2}$. These are both solutions to the original equation.
6. Ask if there are any questions as to how we got those numbers.
7. Remind them if there is no number in front of the variable, the coefficient is 1.

8. Have students open books to page 484 and read aloud example 2 (Gardner: Verbal-Linguistic).
9. Write on board and explain what the book did.
10. Put three examples on board and ask students to solve on a sheet of paper (Gardner: Logical/Mathematical). Have three students put their work and answer on the board and sit down.
11. Explain what they did and correct any mistakes. Ask what they could do to test if the answer is correct (Bloom: Synthesis).
12. Ask what would happen if the radicand was negative (Bloom: Application).
13. Ask if there are any questions.
14. Hand out worksheet and explain directions. Have students finish before the end of the period.

Closure: After all students are done, have students sing the quadratic formula song a few more times to help them remember the formula they have learned.

Adaptations/Enrichments:

A student with ADHD: Write the instructions on the board, so they know what to do if they missed the verbal instructions. Ask a neighboring student to make sure the student stays on task.

Self Reflection: Did the students meet the objective? If not, why did they not meet the objective? Do I need to go over the lesson again? Did the students have time to finish the worksheet? How could I improve this lesson?

Quadratic Formula Worksheet

Name: _____

Directions: Use the quadratic formula to solve the following problems. Show all work.

1. $2x^2 + 7x + 5 = 0$

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

3. $-x^2 + 12x - 4 = 0$

4. $4x^2 - 5x + 6 = 0$

Review Problem: Using any of the methods we have learned (graphing, factoring, or quadratic formula) so the following equation.

5. $3x^2 - 12x + 9 = 0$

Manchester College

Lesson plans- EDUC 230

Name: _____ Teacher: Dr. Korrine Gust

Date : _____ Title of Work: _____

	Criteria				Points
	1	2	3	4	
MC Lesson Plan Format with explicitly stated Academic Standards. **C1-** Plans informative, developmentally appropriate lessons and/or units INTASC 2, 3, 4, 7	Lesson does not follow MC format or state academic standards.	Lesson does not follow MC format but does state academic standards.	Lesson plan follows most of the MC format and explicitly states academic standards.	Lesson plan follows MC format correctly and explicitly states academic standards.	_4___
Lesson Plan Objectives **C1-** Plans informative, developmentally appropriate lessons and/or units INTASC 2, 3, 4, 7	Objectives are not included.	Objectives are included, but are not correctly written or do not relate to the stated academic standard(s).	Objectives are included, relate to stated academic standard(s), but are not written correctly.	Objectives are well written, and correlate well to stated academic standard(s).	__4__
Assessment **A1-** Develops appropriate tools to assess learning INTASC 4, 8	No assessment is planned.	Planned assessment does not match learning objectives.	Planned assessment matches learning objectives, but is not a part of the procedures for the lesson.	Planned assessment matches learning objectives and is embedded in the procedures for the lesson.	4
Procedures are thoroughly written, including Gardner's MI and Bloom's Taxonomy questions. **C6-** Uses effective questioning strategies INTASC 4, 5, 7	Procedures are unclear and do not include Gardner or Bloom references.	Procedures are mostly clear and attempts to include Gardner and Bloom references.	Procedures are clear and references to Gardner and Bloom are attempted.	Procedures can be easily replicated by others including Bloom's questions and the use of Gardner's MI.	_2___
Adaptations/Modifications and Enrichment Opportunities **E1-** Differentiates learning opportunities that respond to individual learning styles and learning challenges INTASC 2, 3, 4, 5	Lesson does not include reasonable adaptations, modifications and/or enrichment opportunity.	Lesson includes one reasonable adaptation and/or modification and an enrichment opportunity.	Lesson includes more than one reasonable adaptation and/or modifications and an enrichment opportunity.	Lesson thoroughly details reasonable adaptations, modifications, and enrichment opportunities that are exemplary.	__3__
Grammar and Spelling **R5-** Models	5 or more errors in grammar and/or	3-4 errors in grammar and/or	1-2 errors in grammar and/or	No errors in grammar and/or	__4__

appropriate written communication skills INTASC 6	spelling are present.	spelling are present.	spelling are present.	spelling are present.	
				Total---->	_21/24___

Teacher Comments: