

A. Lesson Context

BIG PICTURE of this UNIT:	<ul style="list-style-type: none"> • How & why do we build NEW knowledge in Mathematics? • What NEW IDEAS & NEW CONCEPTS can we now explore with specific references to QUADRATIC FUNCTIONS? • How can we extend our knowledge of FUNCTIONS, given our BASIC understanding of Functions? 		
CONTEXT of this LESSON:	<p>Where we've been</p> <p>In Unit 2, you worked with quadratic MODELS focusing on the vertex in QE the form of $y = a(x - h)^2 + k$</p>	<p>Where we are</p> <p>NOW we will focus on the ROOTS of quadratic equations & how these solutions relate to word problems and can be extended to develop new function concepts?</p>	<p>Where we are heading</p> <p>How do we extend our knowledge & skills of the algebra of quadratic functions, and build in new ideas & concepts involving functions.</p>

B. Lesson Objectives

- Understand various factoring strategies that can be applied to solving quadratic equations in standard form.
- Investigate other algebraic strategies for solving special types of quadratic equations
- Apply these strategies to quadratic models in variety of contexts as well as to graphs of quadratic functions.

C. Fast Five (Skills Review Focus)

2. Factor each expression.

- (a) $x^2 + 3x + 2$
 (d) $c^2 + 2c - 15$
 (g) $m^2 - 5m - 14$
 (j) $a^2 + 6a + 9$
 (m) $x^2 + 5x - 36$
 (p) $v^2 + 6v - 27$

3. Factor each expression. Ret

- (a) $3x^2 + 24x + 45$
 (d) $5x^2 - 10x + 5$
 (g) $8m^2 - 104m + 336$

6. Factor each expression.

- (a) $2t^2 + t - 6$
 (d) $9x^2 + 12x + 4$
 (g) $2y^2 + 3y + 1$
 (j) $6x^2 + 5x + 1$
 (m) $2d^2 + 5d + 2$

4. Factor each expression.

- (a) $x^2 - 25$
 (d) $x^2 - 81$
 (g) $9x^2 - 4$
 (j) $16c^2 - 81$

D. Algebraic Strategies & Skills To Solve by Factoring when $a = 1$

Solve by factoring:

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

2. $t^2 - 3t - 18 = 0$

3. $z^2 - 6z + 5 = 0$

4. $x^2 - 7x + 6 = 0$

5. $x^2 + 9x + 8 = 0$

6. $v^2 + 10v + 9 = 0$

7. $x^2 - 10x + 25 = 0$

8. $y^2 - 12y + 36 = 0$

9. $10y^2 + 5y = 0$

10. $8x^2 - 12x = 0$

11. $x^2 - 21 = 4x$

12. $t^2 - 20 = t$

1. $x^2 + 5x + 6 = 0$

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

3. $a^2 - 9a + 18 = 0$

4. $t^2 + 2t - 19 = 5$

5. $x^2 + 15x + 30 = -6$

6. $d^2 + 10d = -16$

7. $2x^2 + 6x + 4 = 0$

8. $3a^2 - 12a = 15$

9. $c^2 - 6c + 9 = 0$

10. $5x^2 - 14x + 8 = 0$

11. $h^2 - 7 = 9$

12. $7t^2 - 15t + 6 = 4$

13. $d^2 + 10d + 18 = -7$

14. $4x^2 - 46 = 3$

15. $11a^2 - 32a + 17 = 20$

16. $4n^2 + 12n + 9 = 0$

17. $5x^2 - 11x - 3 = 2x + 3$

18. $6t^2 - 15t - 36 = 0$

19. $12h^2 + 40h + 32 = 0$

22. $16y^2 - 1 = 0$

23. $4z^2 - 25 = 0$

24. $x + 28 = x(x - 2)$

25. $y + 12 = y(y - 3)$

26. $x^2 - 4x - 4 = 3x^2 - 5x - 3$

27. $x^2 + 2x + 3 = (2x - 1)(x + 5)$

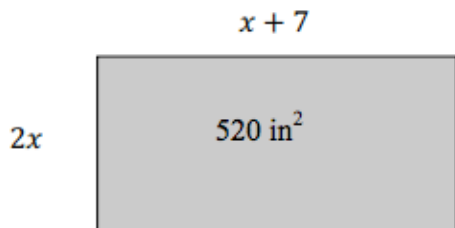
29. $x^2 + x - 1 = (2x + 1)(x + 2)$

III. Challenge Problems

20. $3x^3 + 21x^2 + 36x = 0$

22. $x^4 - 13x^2 + 36 = 0$

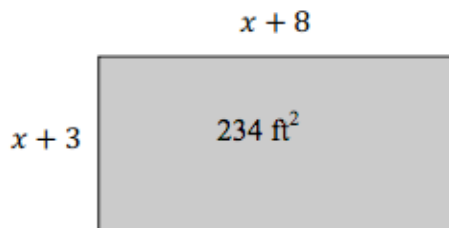
24. Find the dimensions of the rectangle below.



21. $2a^3 - 18a^2 + 36a = 0$

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

25. Find the dimensions of the rectangle below.

CHALLENGE: [Watch Factoring Cubics by Grouping](#): video link & continue on the following worksheet

(http://www.youtube.com/watch?v=pCv6Eom9o0A)

Name : _____

Score : _____

Teacher : _____

Date : _____

Factoring By Grouping

Factor each completely. If non-factorable, write "Non-factorable".

1) $d^3 + 6d^2 - 6d - 36$

6) $18q^3 + 30q^2 + 15q + 25$

2) $3c^3 - 21c^2 - 21c + 147$

7) $18s^3 + 24s^2 + 12s + 16$

3) $6w^3 - 36w^2 + 30w - 180$

8) $x^3 + 4x^2 - 3x - 12$

4) $12m^3 + 15m^2 + 8m + 10$

9) $144r^3 + 216r^2 + 48r + 72$

5) $w^3 - 5w^2 + 7w - 35$

10) $9b^3 + 27b^2 + 24b + 72$

