Unit 3B Solving Quadratics

Name: _____

Solving Quadratics by Factoring

Principle of Zero Products

If $ab = 0$, then either $a = 0$ or $b = 0$, or both a and b are 0.

* Standard form

1. Factor Quadratic using any method.
2. Set all factors equal to zero (Zero Products)
3. Solve for unknown variable

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

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

$x + 2 = 0$

$-2 \quad -2$

$x = -2$

$x + 1 = 0$

$-1 \quad -1$

$x = -1$

Solving Quadratic Equations by Factoring

$x^2 - 4x$

1. $x(x - 4) = 0$

$\boxed{x = 0}$ $x - 4 = 0$

$\boxed{x = 4}$

2. $(x - 4)(2x + 5) = 0$

$x - 4 = 0$

$\boxed{x = 4}$

$2x + \cancel{5} = 0$

$\cancel{-5} \quad -5$

$\frac{2x}{2} = \frac{-5}{2}$

$\boxed{x = \frac{-5}{2}}$

3. $m^2 - 10m = 0$

$m(m - 10) = 0$

$\boxed{m = 0}$ $m - 10 = 0$

$\boxed{m = 10}$

4. $9x^2 - 49 = 0$

$(3x + 7)(3x - 7) = 0$

$3x + 7 = 0$ $3x - 7 = 0$

$\frac{3x}{3} = \frac{-7}{3}$

$\boxed{x = \frac{-7}{3}}$ $\boxed{x = \frac{7}{3}}$

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Challenge Algebra

Name _____

Solving Quadratics By Factoring 03

Date _____ Block ____

Solve each factored equation.

1) $(v+5)(v-2)=0$

2) $(x+5)(x+1)=0$

3) $(a-3)(6a-1)=0$

4) $(n+3)(7n-5)=0$

Solve each equation by factoring.

5) $x^2+4x+3=0$

6) $k^2-5k-24=0$

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

8) $a^2-64=0$

Solve each equation by factoring completely. (Hint: Start by setting equal to zero)

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

10) $b^2+12=-7b$

11) $m^2=-10+7m$

12) $3x^2+27=-18x$

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Solving Quadratics: Square Root Method

Warm up: Simplify the following:

1. $\sqrt{18}$ 2. $\sqrt{2} * \sqrt{10}$ 3. $\sqrt{45}$ 4. $\sqrt{5} * \sqrt{20}$

The Square Root method

Can only be used when there is no "b" term (only an x^2 and constant).

Looks like:

$y = 2x^2 + 90$ or $y = (x+2)^2 - 25$

We CANNOT solve by taking square roots when the problem looks like this:

$x^2 - x + 15 = 4$

Follow these steps to solve: Step 1 – _____

Step 2 – _____

Step 3 – _____

* Notes: Keep answers in simplified radical form

If get a negative underneath square root → answer is no real solution Ex: $x = \sqrt{-2}$

Example 2: Solve each quadratic equation by using square roots.

a.) $3x^2 = 75$	b.) $24x^2 - 6 = 0$	c.) $6 - 4x^2 = -18$	d.) $8x^2 - 10 = 214$	e.) $2x^2 + 16 = 0$

f.) $(2x + 4)^2 - 24 = 0$

g.) $2(x - 2)^2 - 24 = 0$

Elementary Algebra Skill

Solving Quadratic Equations: Square Root Law

Solve each equation by taking square roots.

1) $r^2 = 96$

2) $x^2 = 7$

3) $x^2 = 29$

4) $r^2 = 78$

5) $b^2 = 34$

6) $x^2 = 0$

7) $a^2 + 1 = 2$

8) $n^2 - 4 = 77$

9) $m^2 + 7 = 6$

10) $x^2 - 1 = 80$

11) $4x^2 - 6 = 74$

12) $3m^2 + 7 = 301$

13) $7x^2 - 6 = 57$

14) $10x^2 + 9 = 499$

15) $(p - 4)^2 = 16$

16) $(2k - 1)^2 = 9$

17) $(6x + 2)^2 + 4 = 28$

18) $10(x - 7)^2 = 440$

19) $9(2m - 3)^2 + 8 = 449$

20) $4(6x - 1)^2 - 5 = 223$

AC Math 1 **Name** _____

Solving Quadratic Equations
By Factoring & Using Square Roots

Solve each equation or find the zeros of the function by factoring or using square roots.

1. $6x^2 = 14x$

2. $x^2 - 16 = 0$

3. $2(x+4)^2 - 10 = 0$

4. $x^2 + 8x + 15 = 0$

5. $4(x-1)^2 - 100 = 0$

6. $9x(x-7) - 4(x-7) = 0$

7. $2x^2 = 5x + 3$

8. $(x+6)^2 - 40 = 0$

9. $\frac{1}{4}(x+3)^2 - 1 = 0$

10. $f(x) = \frac{2}{3}x^2 - 12$

11. $f(x) = 16x - 24$

12. $f(x) = 10x^2 + 25x - 60$

13. $f(x) = 4x^2 - 1$

14. $f(x) = 16x^2 - 9$

15. $f(x) = 5x(2x-1) + 3(2x-1)$

16. $f(x) = 21x - 3x^2$

17. $f(x) = 4\left(x - \frac{7}{2}\right)^2 - 1$

18. $f(x) = 5x^2 - 14x + 8$

Algebra 1 Name_____ ID: 1

Completing the Square Homework Day 1

Date_____ Period____

Find the value of c that completes the square.

1) $x^2 + 6x + c$

2) $p^2 - 26p + c$

3) $x^2 - 12x + c$

4) $n^2 + 9n + c$

Solve each equation by completing the square.

5) $p^2 - 12p + 35 = 0$

6) $b^2 - 2b - 99 = 0$

7) $x^2 + 2x - 12 = 0$

8) $x^2 + 4x - 39 = 0$

9) $k^2 - 8k - 90 = 7$

10) $a^2 + 2a - 41 = 7$

Algebra 1 Name_____ ID: 1

Completing the Square HW 2

Date_____ Period____

Find the value of c that completes the square.

1) $x^2 - 10x + c$

2) $x^2 - 11x + c$

Solve each equation by completing the square.

3) $x^2 - 18x + 56 = 0$

4) $x^2 - 6x - 91 = 0$

5) $v^2 + 18v + 23 = -9$

6) $n^2 + 6n - 8 = 8$

7) $10x^2 - 20x - 30 = 0$

8) $6a^2 + 12a - 66 = 0$

9) $7x^2 + 14x - 52 = 4$

10) $3x^2 - 6x - 52 = -7$

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Algebra 1 Name_____ ID: 1

Unit 3B Test Review

Date_____ Period____

Factor the common factor out of each expression.

1) $5r^4 - 50r^3 - 50r^2$

2) $-28b^6 - 20b^4 - 16b^3$

Solve each equation by factoring.

3) $r^2 + 2r - 3 = 0$

4) $n^2 + 4n = 0$

5) $x^2 + 4x - 26 = -5$

6) $r^2 - 3r = -2$

7) $7a^2 + 22a + 3 = 0$

8) $2x^2 - 5x - 3 = 0$

Solve each equation by taking square roots.

9) $9v^2 = 81$

10) $v^2 + 1 = 101$

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11) $8x^2 + 4 = 84$

12) $5n^2 + 1 = 96$

13) $81b^2 + 1 = 2$

14) $10b^2 - 4 = 476$

Solve each equation by completing the square.

15) $m^2 - 8m - 84 = 0$

16) $n^2 - 6n - 24 = 0$

17) $r^2 - 20r + 89 = -10$

18) $x^2 - 8x - 87 = -7$

19) $a^2 - 20a + 59 = 8$

20) $b^2 - 4b - 53 = -4$