

March 25, 2019, Monday

Which of these is NOT a function? → Vertical Line Test!

A. (5, 3), (6, 4), (7, 3), (8, 4)

B.

C.  $y = 3x^2$

D.

$x = 1$   
 $x = 2$   
 $x = 3$   
 $x = 4$

Let's review factoring quadratics.....

Algebra 1  
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 Assignment Date: \_\_\_\_\_ Period: \_\_\_\_\_

Solve each equation by factoring.

1)  $x^2 - 9x + 8 = 0$   
 $(x-8)(x-1) = 0$   
 $x = 8$  or  $x = 1$

2)  $x^2 - x - 42 = 0$   
 $(x+6)(x-7) = 0$   
 $x = -6$  or  $x = 7$

Solve each equation by taking square roots.

3)  $x^2 = -500$   
 $\sqrt{x^2} = \sqrt{-500}$   
 $x = \pm 10$   
 $n = 10, n = -10$

Solve each equation by completing the square.

4)  $p^2 + 6p - 7 = 0$   
 $p^2 + 6p = 7$   
 $(p+3)^2 = 7 + 9$   
 $\sqrt{(p+3)^2} = \sqrt{16}$   
 $p+3 = \pm 4$   
 $p = -3 \pm 4$   
 $p = -3 + 4 = 1$   
 $p = -3 - 4 = -7$

Algebra 2  
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 TOD Solving Quadratics (Factoring/Sq. Root/Completing the Square)

Solve each equation by factoring.

1)  $x^2 - 8x = 0$

2)  $x^2 - 16 = 0$   
 DOTS:  $a^2 - b^2 = (a+b)(a-b)$   
 $a = n$   $b = 4$   
 $(n+4)(n-4) = 0$   
 $n+4 = 0$  or  $n-4 = 0$   
 $n = -4$  or  $n = 4$

3)  $x^2 + 9x + 14 = 0$

4)  $5n^2 - 23n - 10 = 0$

Solve each equation by taking square roots.

5)  $9x^2 = 9$

6)  $4x^2 = 400$   
 $\sqrt{4x^2} = \sqrt{400}$   
 $2x = \pm 20$   
 $x = \pm 10$

Solve each equation by completing the square.

7)  $x^2 - 4x + 3 = 0$

8)  $x^2 + 12x + 35 = 0$

Algebra 2  
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 TOD Solving Quadratics (Factoring/Sq. Root/Completing the Square)

Solve each equation by factoring.

1)  $n^2 - 4n - 21 = 0$   
 $(n+3)(n-7) = 0$   
 $n = -3$  or  $n = 7$

2)  $x^2 - 9 = 0$

3)  $n^2 - 6n = 0$   
 $n(n-6) = 0$   
 $n = 0$  or  $n = 6$

4)  $2x^2 + 15x - 8 = 0$

Solve each equation by taking square roots.

5)  $4x^2 = 216$   
 $\sqrt{4x^2} = \sqrt{216}$   
 $2x = \pm 6\sqrt{6}$   
 $x = \pm 3\sqrt{6}$

6)  $8x^2 - 5 = 387$

Solve each equation by completing the square.

7)  $n^2 + 16n - 36 = 0$   
 $n^2 + 16n = 36$   
 $(n+8)^2 = 36 + 64$   
 $n+8 = \pm 10$   
 $n = -8 \pm 10$   
 $n = -8 + 10 = 2$   
 $n = -8 - 10 = -18$

8)  $n^2 - 16n + 60 = 0$

sg....

March 26, 2019, Tuesday

1. What is the y-intercept of the graph of  $h(x) = 2^x - 4^x$ ?

A. (0, -4)  
 B. (0, -3)  
 C. (0, 3)  
 D. (0, 2)

2. What is the range of the graph of  $f(x) = -3(x-4)^2$ ?

A. (-3, 4)  
 B. (-3, ∞)  
 C. (-∞, 4)  
 D. (-∞, ∞)

Answers to Unit 5.3  
 1. B 2. D

Algebra 1 - Day 4  
The solutions of any quadratic equation  $ax^2 + bx + c = 0$  can be found by evaluating the quadratic formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4(a)(c)}}{2(a)}$$

Examples: Use the quadratic formula to solve for x

1.  $2x^2 - 10x - 5 = 0$   
 $a = 2$   $b = -10$   $c = -5$   
 $x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(2)(-5)}}{2(2)}$   
 $x = 5.5, -0.5$

2.  $9x^2 + 2 = 3x$   
 $9x^2 - 3x + 2 = 0$   
 $a = 9$   $b = -3$   $c = 2$   
 $x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(9)(2)}}{2(9)}$   
 $x = \text{NO SOLUTIONS}$

3.  $-x^2 - 6x - 9 = 0$   
 $-x^2 - 6x - 9 = 0$   
 $a = -1$   $b = -6$   $c = -9$   
 $x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(-1)(-9)}}{2(-1)}$   
 $x = -3, -3$

Algebra 1 - USB Day 4  
Solving by the Quadratic Formula

Solve each equation with the quadratic formula.

1)  $4x^2 - 9 = 0$   $a = 4$   $b = 0$   $c = -9$   
 $x = 1.5, -1.5$

2)  $6p^2 + 8p - 30 = 0$

3)  $6t^2 + 7t - 68 = 0$   $a = 6$   $b = 7$   $c = -68$   
 $x = 2.833, -4$

4)  $5t^2 + 11 = 0$

5)  $p^2 + 4r - 69 = -9$

6)  $2t^2 - 58 = -8$

7)  $4t^2 - 88 = 21$

8)  $4t^2 = 144$

9)  $2a^2 - 5 + 3a = -10 - 8a^2 + 3a$

10)  $m^2 + 8m + 9 = 2m$   
 $m^2 + 6m + 9 = 0$   
 $(m+3)^2 = 0$   
 $m = -3$

11)  $m^2 - 3n - 45 = 9n$

12)  $12p^2 - 9p - 44 = -4p + 8p^2$

13)  $2t^2 + 11t - 138 = 0$   
 A)  $\{6, -11\}$   
 B) No solution.  
 C)  $\{2.231, -7.731\}$   
 D)  $\{18.473, -7.473\}$

14)  $6a^2 + 7a - 20 = 0$   
 A)  $\{7, -7\}$   
 B)  $\{6, -1.5\}$   
 C)  $\{9.899, -9.899\}$   
 D)  $\{1, -2.167\}$

15)  $4t^2 = 25$   
 A)  $\{1, -1\}$   
 B)  $\{2.5, -2.5\}$   
 C)  $\{0.667, 0.5\}$   
 D)  $\{1.25, -1.25\}$

16)  $6x^2 + 7x - 64 = 4$   
 A)  $\{2.833, -4\}$   
 B)  $\{2.488, -5.488\}$   
 C)  $\{1.198, -2.365\}$   
 D)  $\{2, -6.5\}$

Algebra 1  
TOTD Solving Quadratic Equations (any method)

Solve each equation your way (by factoring, square root, completing the square, or quadratic formula). SHOW ALL OF YOUR WORK!!!

1)  $p^2 + 2p - 143 = 0$

2)  $4x^2 - 9 = 0$

3)  $4x^2 - 7x - 15 = 0$

4)  $4x^2 + 3x - 27 = 0$

Algebra 1  
TOTD Solving Quadratic Equations (any method)

Solve each equation your way (by factoring, square root, completing the square, or quadratic formula). SHOW ALL OF YOUR WORK!!!

1)  $4t^2 - 81 = 0$

2)  $2t^2 - 4t - 16 = 0$

3)  $3t^2 - 48 - 7 = 0$

4)  $4t^2 - 2t - 6 = 0$

Algebra 1  
USB SG - Solving Quadratic Functions

Solve each equation by factoring.

1)  $x^2 - 18x + 81 = 0$   
 $(x-9)^2 = 0$   
 $x = 9$

2)  $m^2 - m - 12 = 0$   
 $(m+3)(m-4) = 0$   
 $m = -3, 4$

3)  $7r^2 + 3r = 0$   
 $r(7r+3) = 0$   
 $r = 0, -3/7$

4)  $p^2 + 1 = 82$   
 $p^2 = 81$   
 $p = \pm 9$

5)  $6a^2 = 60$   
 $a^2 = 10$   
 $a = \pm \sqrt{10}$

\* don't forget you can decimals or fractions

Solve each equation by completing the square.

7)  $x^2 + 12x + 37 = 0$   
 $x^2 + 12x = -37$   
 $(x+6)^2 = 45+36$   
 $(x+6)^2 = 81$   
 $x+6 = \pm 9$   
 $x = -6 \pm 9$   
 $x = 3$   
 $x = -15$   
*You can have decimals or fractions!*

Solve each equation with the quadratic formula.

8)  $2x^2 - 10x + 11 = 0$   
 $a=2, b=-10, c=11$   
 $\frac{-(-10) \pm \sqrt{(-10)^2 - 4(2)(11)}}{2(2)}$   
 $x = 3.4$   
 $x = 1.6$

Solve each equation by factoring, use any factoring method you choose.

9)  $x^2 + 7x + 6 = 0$  *facto*  
 $(x+1)(x+6) = 0$   
 $x = -1$   
 $x = -6$

10)  $7x^2 - 42x = 0$  *GC*  
 $7x(x-6) = 0$   
 $x = 6$   
 $x = 0$

11)  $3m^2 - 6m - 9 = 0$  *Bottom up*  
 $3(m^2 - 2m - 3) = 0$   
 $3(m-3)(m+1) = 0$   
 $m = -1, m = 3$

12)  $n^2 + 5n + 15 = 0$  *quadratic eqn*  
 $n = -3, -5$

Algebra 1  
 U3B SG - Solving Quadratic Functions

Solve each equation by factoring.

1)  $(x-1)(5x+8) = 0$   
 $x = 1, -\frac{8}{5}$

2)  $m^2 - n - 12 = 0$   
 $(n-3)$

3)  $7x^2 + 3x = 0$   
 $x = -\frac{3}{7}, 0$

Solve each equation by taking square roots.

4)  $a^2 = 25$   
 $a = 5, -5$

5)  $p^2 + 1 = 82$   
 $p = 9, -9$

6)  $-4 + 6a^2 = 60$   
 $a = 3, -3$

Solve each equation by completing the square.

7)  $x^2 + 12x - 37 = 8$   
 $(3, -15)$

Solve each equation with the quadratic formula.

8)  $2x^2 - 10x + 11 = 0$   
 $\frac{5 \pm \sqrt{5}}{2}, \frac{5 - \sqrt{5}}{2}$

Solve each equation by factoring, use any factoring method you choose.

9)  $x^2 + 7x + 6 = 0$   
 $(-1, -6)$

10)  $7x^2 - 42x = 0$   
 $(6, 0)$

11)  $3m^2 - 6m - 9 = 0$   
 $(-1, 3)$

12)  $n^2 + 5n + 15 = 0$   
 $(-3, -5)$

March 27, 2019, Wednesday

**SAMPLE ITEMS**

1. What are the zeros of the function represented by the quadratic expression  $2x^2 + x - 3$ ?

A.  $x = \frac{3}{2}$  and  $x = 1$   
 B.  $x = -\frac{2}{3}$  and  $x = 1$   
 C.  $x = -1$  and  $x = \frac{2}{3}$   
 D.  $x = -1$  and  $x = -\frac{3}{2}$

*Handwritten notes:*  
 $x^2 + x - 6 = (x-2)(x+3)$   
 $(x-1)(2x+3) = 0$   
 $x = 1, -\frac{3}{2}$   
 a ≠ 1  
 bottoms up...  
 but not always

**Bottoms up**  
 $0 = 3x^2 - 6x - 9$   
 $0 = x^2 - 2x - 3$   
 $0 = (x+1)(x-3)$   
 $x = -1, 3$

**GCF: !!**  
 $0 = 3(x^2 - 2x - 3)$   
 $0 = 3(x+1)(x-3)$   
 $x = -1, 3$

**QF:**  
 $x =$   
 $a = 3$   
 $b = -6$   
 $c = -9$

GSE Algebra 1 Solving Quadratics Notes

Name: \_\_\_\_\_ Date: \_\_\_\_\_

A quadratic equation is any equation having the form  $ax^2 + bx + c = 0$ . A quadratic function forms a graph called a parabola (shaped like a u). In this unit, we will solve quadratic equations, meaning we will find the values of  $x$  when  $y = 0$ .

**Solving Quadratics by Graphing**

**Solve a Quadratic by Graphing**  
 To solve a quadratic by graphing is to find where the parabola crosses the  $x$ -axis.

We call these the **solutions, roots, zeros, or  $x$ -intercepts**.

**Example:** Find the zeros.

*Graphs showing parabolas crossing the x-axis at various points.*

**Practice:** Identify the solutions of each quadratic graph.

1. *Graph with x-intercepts at -2 and 4.*  
 2. *Graph with x-intercepts at -1 and 3.*  
 3. *Graph with x-intercepts at 1 and 5.*

Quiz....

You may **skip** one from the front & **skip** one from the back. Please write "**SKIP**" on the problems you do not wish to complete.

Algebra 1  
Solving quadratics by graphing

EXAMPLE: Use the graphs below to solve the given quadratic equations.

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

The graph of  $y = -x^2 + 3x + 4$ .

b.  $x^2 - 6x + 9 = 0$

The graph of  $y = x^2 - 6x + 9$ .

c.  $x^2 + 3x + 4 = 0$

The graph of  $y = x^2 + 3x + 4$ .

d.  $x^2 = 6 - x$

The graph of  $y = x^2 + x - 6$ .

**SOLUTIONS:**

a. Since we are given the graph of  $y = -x^2 + 3x + 4$  and we are asked to solve  $0 = -x^2 + 3x + 4$ , we need to look for any places where the graph of  $y = -x^2 + 3x + 4$  intersects the line  $y = 0$ , i.e. we need to find the  $x$ -intercepts of the graph. Since the  $x$ -intercepts are  $(-1, 0)$  and  $(4, 0)$ , we can conclude that the solutions are  $x = -1$  and  $x = 4$ , so the solution set is  $\{-1, 4\}$ .

b. Since the graph of  $y = x^2 - 6x + 9$  intersects the line  $y = 0$  only when  $x = 3$ , we can conclude that the solution set is  $\{3\}$ .

c. Since the graph of  $y = x^2 + 3x + 4$  never intersects the line  $y = 0$  (i.e. the  $x$ -axis), we see that  $x^2 + 3x + 4 = 0$  never equals 0, so we can conclude that the equation  $x^2 + 3x + 4 = 0$  does not have any real solutions. (Note that we can use the quadratic formula or completing the square to find the complex numbers that solve the equation.)

d. Here, we are given the graph of  $y = x^2 + x - 6$  so we need to find the  $x$ -intercepts. The expression  $x^2 + x - 6 = 0$  is the given equation  $x^2 = 6 - x$  which we can do by solving the equation for 0.

$$x^2 + x - 6 = 0 \quad (\text{subtract } 6 - \text{ from both sides})$$

$$\Rightarrow x^2 + x - 6 = 0$$

We can solve this equation by looking for the  $x$ -values where the graph of  $y = x^2 + x - 6$  intersects the line  $y = 0$  (i.e. the  $x$ -axis). Thus, the solution set is  $\{-3, 2\}$ .

Algebra 1  
Solving quadratics by graphing

Solve the following equations by graphing!

EXAMPLE:

a.  $a(x) = (x - 2)^2 - 4$

Vertex:  $(2, -4)$   
Axis of Symmetry:  $x = 2$

b.  $b(x) = -2(x - 6)^2 + 4$

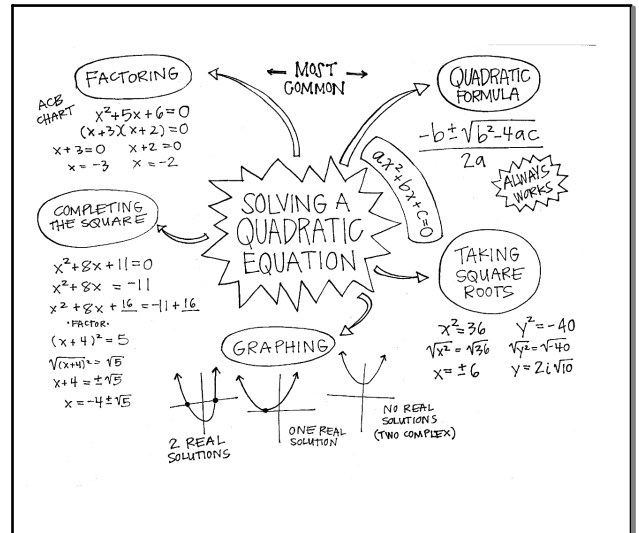
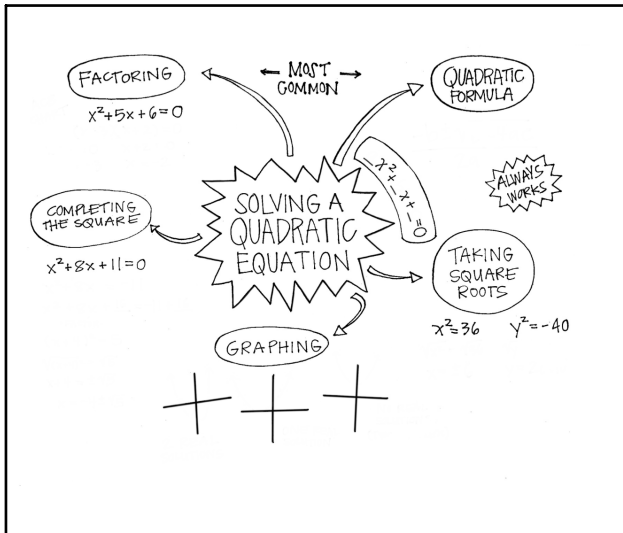
Vertex:  $(6, 4)$   
Axis of Symmetry:  $x = 6$

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

Vertex:  $(-4, 2)$   
Axis of Symmetry:  $x = -4$

d.  $d(x) = (x + 2)^2$

Vertex:  $(-2, 0)$   
Axis of Symmetry:  $x = -2$



quiz...

Item 13

Constructed Response

Marla and Jeff collect data on the number of cars that pass through an intersection every Monday morning for 2 months. They record the findings as 78, 158, 63, 71, 56, 67, 78, and 64. They each use different methods to summarize the typical number of cars that pass through the intersection at the specified time and compare their findings. Jeff says that, on average, 79 cars pass through the intersection each Monday morning. Marla disagrees and says that the mean should not be used and uses the median instead to describe the typical number of cars that pass through the intersection on any given Monday morning.

Part A What is the median value of the data? Write your answer in the space provided.

Part B Explain why the median should be used instead of the mean. Write your answer in the space provided.

Part A \_\_\_\_\_

Part B \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

March 28, 2019, Thursday

4. The expression  $-x^2 + 7x - 600$  represents a company's profit for selling  $x$  items. For which number(s) of items sold is the company's profit equal to \$0?

A. 0 items  
 B. 35 items  
 C. 10 items and 60 items  
 D. 20 items and 30 items

$-x^2 + 7x - 600 = 0$

$a = -1$   
 $b = 70$   
 $c = -600$

4. C

Item 13

Constructed Response

Maria and Jeff collect data on the number of cars that pass through an intersection every Monday morning for 2 months. They record the findings as 78, 126, 97, 72, 96, 98, 96, and 94. They each use different methods to summarize the typical number of cars that pass through the intersection at the specified time and compare their findings. Jeff says that, on average, 79 cars pass through the intersection each Monday morning. Maria disagrees and says that the mean should not be used and uses the median instead to describe the typical number of cars that pass through the intersection on any given Monday morning.

Part A What is the median value of the data? Write your answer in the space provided. Find the 56, 63, 64, 67, 72, 75, 78, 96, 97, 98, 126. Order #s from least to greatest.  $56, 63, 64, 67, 72, 75, 78, 96, 97, 98, 126$ . The median is 72.

Part B Explain why the median should be used instead of the mean. Write your answer in the space provided.

Part A 69

Part B We want to use Maria's median data because it is less, because 126 is an outlier.

If you can't find factors, can't recall bottom's up, etc... Use the quadratic formula.

Algebra 1 Unit 3B Test Review

Remember to allow work! Directions: Solve the given quadratic using the best method.

1.  $x^2 - 14x - 15 = 0$   
 $a=1, b=-14, c=-15$   
 $X = 15, 7$

2.  $3x^2 + 2x - 8 = 0$   
 $a=3, b=2, c=-8$   
 $X = \frac{1}{3}, -2$

3.  $5x^2 + 4x - 12 = 0$   
 $a=5, b=4, c=-12$   
 $X = 2, -\frac{6}{5}$

4.  $2x^2 - 50 = 0$   
 $a=2, b=0, c=-50$   
 $X = 5, -5$

5.  $x^2 + 3x - 10 = 0$   
 $a=1, b=3, c=-10$   
 $X = 2, -5$

6.  $5x^2 + 10x - 3 = 0$   
 $a=5, b=10, c=-3$   
 $X = 5, -\frac{3}{5}$

7.  $3x^2 - 27 = 0$   
 $a=3, b=0, c=-27$   
 $X = 3, -3$

8.  $(x+8)(x-3) = 0$   
 $X = -8, 3$

9.  $x^2 - 4 = 5$   
 $a=1, b=0, c=9$   
 $X = 3, -3$

10.  $x^2 - 6x + 5 = 0$   
 $a=1, b=-6, c=5$   
 $X = 5, 1$

13.  $x^2 - 4x - 12 = 0$

14.  $x^2 + 6 = 5x$

15. Solve the equation by completing the square.

16. Find the zeros of the functions graphed below.

17. Find the zeros of the functions graphed below.

18. What are the solutions of  $(x+5)(x-2) = 0$ ?

19. What are the solutions of  $(2x-4)(3x+7) = 0$ ?

March 29, 2019, Friday

14.  $x^2 + 6 = 5x$

$-5x - 5x = -5x - 5x$   
 $x^2 - 5x + 6 = 0$   
 $a=1, b=-5, c=6$   
 $X = 2, 3$

16. Find the zeros of the functions graphed below.

17. Find the zeros of the functions graphed below.

Do you need to see more of the sg? ...test

Unit 3B SPIRAL REVIEW

1. What are the solutions to the equation  $2x^2 - 2x - 12 = 0$ ?

2. Factor the equation to find the zeros of the function.  $3x^2 - 9x - 30 = 0$

3. What is the solution to the linear system?

4. Determine the range of the function.

5. If a system of linear equations has no solution, what do you know about the graphs of the equations?

6. A bird chirps 10 times a minute. Determine how many times the bird would chirp in a day.

7. A culture of bacteria doubles every hour. If there are 500 bacteria at the beginning, how many bacteria will there be after 9 hours?

8. What is the asymptote of the function:  $f(x) = \frac{1}{(x-2)}$ ?

9. What is the y-intercept of the function whose equation is  $y = 2(3)^x$ ?

10. Write the Quadratic Formula here and tell me how do know if it will solve for 1 solution, 2 solutions or no solutions?