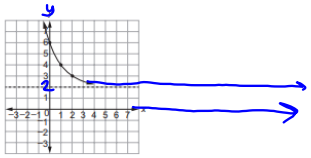
March 18, 2019, Monday

Item 21

Multi-Part Technology-Enhanced

The graph of the exponential function $f(x) = 4(0.5)^x + 2$ is shown.



Part A

Which function has the same end behavior as f(x) for large, positive values of x?

$x \to \infty, f(x) \to 2$

A. $g(x) = 4(1.1)^x + 3$
B. $g(x) = 0.5(1.1)^x + 2$
C. $g(x) = 4(0.8)^x + 3$
D. $g(x) = 0.5(0.8)^x + 2$

Part B

Which function's graph has a y-intercept of 1?

A. $h(x) = 5(2)^x$
B. $h(x) = 5(0.5)^x + 0.5$
C. $h(x) = (0.5)^x + 1$
D. $h(x) = 0.5(2)^x + 0.5$

March 19, 2019, Tuesday

March 20, 2019, Wednesday

Factor each completely.

3) $25p^2 - 4$ $a = 5p$ $b = 2$

$(5p+2)(5p-2)$

5) $n^2 - 3n - 4$

$(n+1)(n-4)$

6) $r^2 - 1$ $a = r$ $b = 1$

$(r+1)(r-1)$

7) $n^2 + 19n - 40$

$n^2 + 19n - 120$

$(n-5)(n+24)$

$(3n-5)(n+8)$

Algebra 1 – Unit 2B Day 1 **Solving Quadratic Equations by Factoring**

Zero Product Property

If $a \cdot b = 0$, then either $a = 0$, or $b = 0$. In other words, when two expressions are being multiplied and the result is zero, one of the two expressions must be equal to zero.

Ex: If $3 \cdot b = 0$, then "b" must be equal to 0. Or if $a \cdot 5 = 0$, then "a" must be equal to 0.

$x^2 - 2x - 15$ ← old

A few more examples:

If $(x + 3)(x - 5) = 0$, then either $x + 3 = 0$, **OR** $x - 5 = 0$.

If $(x - 1)(x - 6) = 0$, then either $x - 6 = 0$, **OR** $x - 1 = 0$.

If $(2x + 7)(x - 4) = 0$, then either $2x + 7 = 0$, **OR** $x - 4 = 0$.

How to solve these equations:

Original Problem	$(x + 3)(x - 5) = 0$	
Step 1 – Set each expression equal to zero	$(x + 3) = 0$	$x - 5 = 0$
Step 2 – Solve each equation	$x + 3 = 0$ $-3 \quad -3$	$x - 5 = 0$ $+5 \quad +5$
Answer – There should be 2	$x = -3$	$x = 5$

Try another: $(2x + 3)(x - 4) = 0$

$2x + 3 = 0$ $\quad -3 \quad -3$ → $\frac{3x}{2} = \frac{-3}{2}$ → $x = -\frac{3}{2}$

$x - 4 = 0$ $\quad +4 \quad +4$ → $x = 4$

MOST OF THE TIME, the problem will not be set up as above. In other words, those problems were already factored like: $(2x + 3)(x - 4) = 0$

So, here is an example of having to factor before solving:

Original Problem	$x^2 + 7x + 12 = 0$	
Step 1 – Factor	$(x + 3)(x + 4) = 0$	
Step 2 – Set each expression equal to zero	$x + 3 = 0$	$x + 4 = 0$
Step 3 – Solve each equation	$-3 \quad -3$	$-4 \quad -4$
Answer – There should be 2	$x = -3$	$x = -4$

3, 12, +7

But the answer might repeat $x = 3$, $x = 3$

Algebra 1 – U3B Day 1 Name _____

Solving Quadratics by Factoring

Notes continued: Solve each equation by factoring.

1) $(v + 5)(v - 7) = 0$ → $v = -5$, $v = 7$

2) $(5n + 2)(n - 2) = 0$ → $n = -\frac{2}{5}$, $n = 2$

3) $v^2 + 6v - 7 = 0$ → $(v - 1)(v + 7) = 0$ → $v = 1$, $v = -7$

4) $m^2 + 3m - 10 = 0$ → $(m - 2)(m + 5) = 0$ → $m = 2$, $m = -5$

5) $n^2 + 7n = 0$ → $n(n + 7) = 0$ → $n = 0$, $n = -7$

6) $n^2 + 7n = 0$ → $n \cdot n + 7 \cdot n = 0$

7) $v^2 + v - 12 = 0$ → $(v + 4)(v - 3) = 0$ → $v = -4$, $v = 3$

TEST 2, 4, 6

Solve each equation by factoring.

8) $(2x - 7)(3x - 7) = 0$

9) $(r + 7)(r - 1) = 0$

10) $v(v + 7) = 0$

11) $(n + 3)(n + 7) = 0$

12) $k^2 - k - 42 = 0$

13) $p^2 - 9p + 20 = 0$

14) $p^2 + 4p + 4 = 0$

15) $p^2 - 4p - 32 = 0$

16) $7k^2 - 8k = 0$

17) $7n^2 + 10n - 8 = 0$

18) $7b^2 - 12b - 4 = 0$

19) $2v^2 + 15v + 25 = 0$

Algebra 1 Name _____

TOTD Solve by Factoring

Solve each equation by factoring.

1) $(r - 8)(8r - 1) = 0$

2) $n^2 + 6n = 0$

3) $x^2 + 10x + 16 = 0$

4) $5k^2 + 11k + 6 = 0$

5) $n^2 - 16 = 0$

Algebra 1 Name

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TOTD Solve by Factoring

Solve each equation by factoring.

1) $(7x+1)(x+7)=0$

2) $p^2-6p+5=0$

3) $r^2-49=0$

4) $2a^2-13a-7=0$

5) $n^2+n=0$

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March 19, 2019, Tuesday

Item 18

Constructed-Response

Shaun recycles bottles and cans. He earns 10 cents for each bottle he recycles and 5 cents for each can he recycles. After recycling a bag of bottles and cans, he gets a receipt that states he earned $12.75 and recycled a total of 210 bottles and cans. To determine the number of bottles and the number of cans he recycled, Shaun writes the system of equations below.

$x + y = 210$

$10x + 5y = 1275$

1) Graphing?
2) Substitution
3) Elimination ★

Part A What does the x represent in terms of the situation? Write your answer in the space provided.

Part B Shaun graphs lines to represent the equations in his system. What are the coordinates of the point where the two lines intersect? Write your answer in the space provided.

Part A: Bottles

Part B: $x=45, y=165$

★ of course write your answer to Part A & Part B!

$x+y=210$

$10x+5y=1275$

$-10x-10y=-2100$

$-5y=-825$

$y=165$

$x+165=210$

$x=45$

Algebra 1 ~ Unit 3B Day 2 **Solving Quadratic Equations by Square Roots**

MGSE9-12.A.REI.4: I can solve a quadratic equation with one variable.

- A square root is written with the radical symbol...
- The opposite of being something being squared is to take the ____
- **The goal is to get the variable squared by itself!**

What do you think we should do? **ONE step:**

1. $x^2=25$ → $x=\pm\sqrt{25}$, $x=\pm 5$

2. $x^2=32$ → $x=\pm 5.7$

Solve the following TWO Step equations:

3. $x^2-9=7$ → $x=\pm\sqrt{16}$, $x=\pm 4$

4. $x^2+13=5$ → $x=\sqrt{-8}$, $x=$ Undefined

5. $2x^2=14$ → $x=\pm\sqrt{7}$

6. $2x^2=48$ → $x=\pm\sqrt{16}$, $x=$ Und

Solve the following THREE step equations:

7. $5v^2-5=410$ → $5v^2=405$, $v=\pm\sqrt{81}$, $v=\pm 9$

Solve the following MULTI step equations:

8. $(x+3)^2=1$ → $x+3=\pm 1$, $x=-3\pm 1$, $x=-2$, $x=-4$

9. $(x+3)^2+4=-5$ → $(x+3)^2=-9$, $x+3=\pm$ UND

10. $(x-10)^2=\frac{25}{4}$ → $x-10=\pm\frac{5}{2}$, $x=10\pm\frac{5}{2}$, $x=\frac{25}{2}$, $x=\frac{15}{2}$

11. $3(x+3)^2-12=0$ → $3(x+3)^2=12$, $(x+3)^2=4$, $x+3=\pm 2$, $x=-3\pm 2$, $x=-1$, $x=-5$

Algebra 1 ~ Unit 3B Day 3 **Solving Square Roots Practice** Name

Solve each quadratic equation.

1. $x^2-9=27$ → $x^2=36$, $x=\pm\sqrt{36}$, $x=-6$

2. $3x^2-7=47$ → $3x^2=54$, $x^2=18$, $x=\pm\sqrt{18}$, $x=\pm 4.2$

3. $x^2+11=16$ → $x^2=5$, $x=\pm\sqrt{5}$

4. $(x+4)^2=21$ → $x+4=\pm\sqrt{21}$, $x=-4+\sqrt{21}=7$, $x=-4-\sqrt{21}=-15$

5. $(2x-3)^2=9$ → $2x-3=\pm 3$, $2x=3\pm 3$, $x=\frac{3+3}{2}=3$, $x=\frac{3-3}{2}=0$

6. $(x-7)^2=81$ → $x-7=\pm 9.9$, $x=7\pm 9.9$, $x=16.9$, $x=-2.9$

7. $(x+3)^2+6=18$ → $(x+3)^2=12$, $x+3=\pm\sqrt{12}$, $x=-3\pm 3.4$, $x=0.4$, $x=-6.4$

8. $(2x+6)^2-8=24$ → $(2x+6)^2=32$, $2x+6=\pm 5.6$, $2x=-6\pm 5.6$, $x=-0.4$, $x=-5.6$

9. $x^2+21=5$ → $x^2=-16$, $x=\sqrt{-16}$, Undefined

10. $3(x+4)^2-7=5$ → $3(x+4)^2=12$, $(x+4)^2=4$, $x+4=\pm 2$, $x=-4\pm 2$, $x=-2$, $x=-6$

11. $3x^2-12=2x^2-1$ → $x^2-12=-1$, $x^2=11$, $x=\pm\sqrt{11}$

12. $\frac{2}{5}x^2-3=7$ → $\frac{2}{5}x^2=10$, $x^2=25$, $x=\pm 5$

Algebra 2 Name

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TOTD Solving Quadratics by Factoring/Square Roots

Solve each equation by factoring or taking square roots.

1) $b^2+4b=0$

2) $b^2-5b-6=0$

3) $p^2-1=0$

4) $10r^2-17r+3=0$

5) $x^2=4$

6) $x^2+8=12$

7) $36x^2+7=71$

8) $(x-4)^2=25$

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Algebra 2 Name

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TOTD Solving Quadratics by Factoring/Square Roots

Solve each equation by factoring or taking square roots.

1) $m^2-3m+2=0$

2) $n^2+5n=0$

3) $n^2-16=0$

4) $7v^2+23v+6=0$

5) $r^2=16$

6) $36n^2=16$

7) $8k^2-2=390$

8) $(x+4)^2=25$

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~~March 20, 2019, Wednesday~~ March 22, 2019, Friday!

Item 14

Selected-Response

Which value is an irrational number?

A. $4+\sqrt{7}$ = 6.645751311

B. $\sqrt{2}\sqrt{8}$ = 4

C. $\frac{\sqrt{3}\sqrt{12}}{5}$ = 1.2

D. $\sqrt{3}-\sqrt{3}$ = 0

Item 15

Selected-Response

The table defines a quadratic function.

x	y
-1	5
0	1
1	-1
3	1

What is the average rate of change between $x = -1$ and $x = 1$?

A. undefined

B. $-\frac{1}{3}$

C. -3

D. -4

Slope Formula $m = \frac{y_2 - y_1}{x_2 - x_1}$

$\frac{5--1}{-1-1} = -3$

U3A Test Review

3, 4, 5, 7

3): $x^2 - 11x + 18$

C $(x-2)(x-9)$

ALSO!

$(x+2)(x-9)$

$x^2 - 9x + 2x - 18$

$x^2 - 7x - 18$

$(x-2)(x+9)$

$x^2 + 9x - 2x - 18$

$x^2 + 7x - 18$

$(x-2)(x-9)$

$x^2 - 9x - 2x + 18$

$x^2 - 11x + 18$

4): $x^2 - 2x - 15$

B $(x+3)(x-5)$

5): $x^2 + bx - 24$

a) 4

b) 5

c) 8

d) 12

$5 = b$

$-3 + 8$

-24

$1 + -24 = -23$

$-1 + 24 = 23$

$2 + -12 = -10$

$-2 + 12 = 10$

$3 + -8 = -5$

$-3 + 8 = 5$

$4 + -6 = -2$

$-4 + 6 = 2$

7) $2x^2 + 3x - 5$ $a \neq 1$ X 12, 11

$x^2 + 3x - 10$ $a = 1$

$(x+5)(x-2)$

A. $(2x+5)(x-1)$

8) $2x^2 - 13x + 6$

$x^2 - 13x + 12$

$(x - \frac{1}{2})(x - 12)$

$(2x-1)(x-6)$ B

11) $2x^2 + 5x + 3$

$x^2 + 5x + 6$

$(x+2)(x+3)$

$(x+1)(2x+3)$ A

16) GCF, DOTS

B) $8x^2 - 18$

$2(4x^2 - 9)$

$2(2x+3)(2x-3)$

22) $8x^2 - 6x - 27$

$x^2 - 6x - 216$

$(x-18)(x+12)$

$(4x-9)(2x+3)$ A

19): $x^2 - 6x + 9$

C $(x-3)(x-3)$

Algebra 1 ~ Unit 3B Day 3 **Solving Quadratic Equations by Completing the Square**

MCC9-12.A.REI.4b: I can solve by completing the square.

- Certain quadratic equations can be factored into **Perfect Squares**. Factor the following quadratic expressions to see why these are called **Perfect Square Trinomials:**

$x^2 + 6x + 9$ $(x+3)(x+3)$ $(x+3)^2$ $x^2 - 10x + 25$ $(x-5)(x-5)$ $(x-5)^2$ $x^2 + 12x + 36$ $(x+6)^2$

- **Creating a Perfect Square Trinomial**
  - In the following perfect square trinomial, the perfect square term is missing.
  - Find the constant (c) term by taking half the middle term then squaring it. Put this number in the blank - we say that this number "**completes the square.**"

$x^2 + 14x + \_\_49\_\_$ $\frac{14}{2} = 7^2 = 49$

$(x+7)^2$

- **Create perfect square trinomials by finding the number that completes the square. Then factor the perfect square trinomials:**

$x^2 + 20x + 100$ $(x+10)^2$ $x^2 - 4x + \_\_4\_\_$ $\frac{-4}{2} = (-2)^2 = 4$ $x^2 + 5x + \frac{25}{4}$ $(x+\frac{5}{2})^2$

Solving Quadratic Equations by Completing the Square Example 4

Solve the following equation by completing the square:	$x^2 + 8x - 20 = 0$
Step 1: Get all variables on one side and all numbers without variables on the other side.	$x^2 + 8x = 20$
Step 2: Find the number that completes the square on the left side of the equation. add that term to both sides.	$x^2 + 8x + 16 = 20 + 16$
Step 3: Factor the perfect square trinomial on the left side of the equation. Simplify the right side of the equation.	$(x+4)^2 = \pm\sqrt{36}$
Step 4: Take the square root of both sides.	$x + 4 = -4 \pm 6$
Step 5: Set up the two solution possibilities and solve.	$x = -4 \pm 6$ $x = 2, -10$
Step 6: CHECK YOUR ANSWERS!!!	

*Isolate the variables

* Create a binomial squared $(\frac{b}{2})^2$

* Keep eqn balanced

* Use factoring

Let's try!

Solve each equation by completing the square.

1) $r^2 + 14r - 45 = 6$

$+45 \quad +45$

$r^2 + 14r = 51$

$(r+7)^2 = 51 + 49$

$r + 7 = \pm 10$

$-7 \quad -7$

$r = -7 \pm 10$

$r = 3 \quad r = -17$

2) $m^2 - 16m + 24 = 2$

$-24 \quad -24$

$m^2 - 16m = -22$

$(m+8)^2 = -22 + 64$

$(m+8)^2 = \pm\sqrt{42}$

$m + 8 = \pm\sqrt{42}$

$-8 \quad -8$

$m = -8 \pm \sqrt{42}$

$m = -8 + \sqrt{42} \quad m = -8 - \sqrt{42}$

Algebra 1 ~ Unit 3B Day 3 **Solving by Completing the Square** Name _____

MCC9-12.A.REI.4b

Solving Quadratic Equations by Completing the Square

1. Rewrite so all terms containing x are on one side.
2. Find the number that completes the square on the left side of the equation. Add that number to both sides.
3. Factor the perfect square trinomial on the left side of the equation. Simplify the right side of the equation.
4. Take the square root of each side.
5. Solve for x.
6. Check your answers!!!

Solve each equation.

Graded

1. $x^2 - 10x - 54 = 0$
2. $x^2 - 18x + 77 = 0$
3. $x^2 + 20x - 73 = 0$
4. $x^2 + 6x - 72 = -8$
5. $x^2 - 10x - 56 = 6$
6. $x^2 - 14x - 75 = 8$

$x^2 - 14x = 83$ (+75 +75)

$(x-7)^2 = 83 + 49$

$\sqrt{(x-7)^2} = \pm\sqrt{132}$

$x - 7 = \pm\sqrt{132}$ (+7 +7)

$x = 7 \pm \sqrt{132}$

$x = 7 \pm 2\sqrt{33}$

$x = 5 \pm \sqrt{87}$

$x = 14.3, -4.3$

Algebra 2 Name _____

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TOTD Solving Quadratics (Factoring/Sq. Root/Completing the Square)

Solve each equation by factoring.

1) $k^2 - 8k = 0$
2) $n^2 - 16 = 0$
3) $x^2 + 9x + 14 = 0$
4) $5m^2 - 23m - 10 = 0$

Solve each equation by taking square roots.

5) $9x^2 = 9$
6) $4x^2 + 3 = 403$

Solve each equation by completing the square.

7) $x^2 - 4x + 3 = 0$
8) $k^2 + 12k + 35 = 0$

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Algebra 2 Name _____

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TOTD Solving Quadratics (Factoring/Sq. Root/Completing the Square)

Solve each equation by factoring.

1) $n^2 - 4n - 21 = 0$
2) $x^2 - 9 = 0$
3) $n^2 - 6n = 0$
4) $2r^2 + 15r - 8 = 0$

Solve each equation by taking square roots.

5) $-6x^2 = -216$
6) $8x^2 - 5 = 387$

Solve each equation by completing the square.

7) $n^2 + 16n - 36 = 0$
8) $n^2 - 16n + 60 = 0$

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Algebra 1 ~ Day 4 **Solving by the Quadratic Formula Notes**

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. $2x^2 - 10x - 5 = 0$
2. $9x^2 + 2 = 3x$
3. $-x^2 - 6x = 9$

March 21, 2019, Thursday

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

Algebra 1 ~ Day 4 **Solving by the Quadratic Formula Notes**

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. $2x^2 - 10x - 5 = 0$
2. $9x^2 + 2 = 3x$
3. $-x^2 - 6x = 9$

Algebra 1 – U3B Day 4 Name_____
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Solving by the Quadratic Formula

Solve each equation with the quadratic formula.

1) $4a^2 - 9 = 0$

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

3) $6b^2 + 7b - 68 = 0$

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

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

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

7) $4k^2 - 8k = 21$

8) $4b^2 = 144$

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

10) $m^2 + 8m = 91 + 2m$

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

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

13) $2k^2 + 11k - 138 = 0$
A) {6, −11.5}
B) No solution.
C) {2.231, −7.731}
D) {18.471, −7.471}

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

15) $4k^2 = 25$
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) {12.458, −5.458}
C) {1.198, −2.365}
D) {2, −6.5}

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Algebra 1 Name_____
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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) $4v^2 + 3v - 27 = 0$

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Algebra 1 Name_____
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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) $4v^2 + 3v - 27 = 0$

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March 22, 2019, Friday

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, 158, 63, 71, 56, 67, 75, 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. 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.**

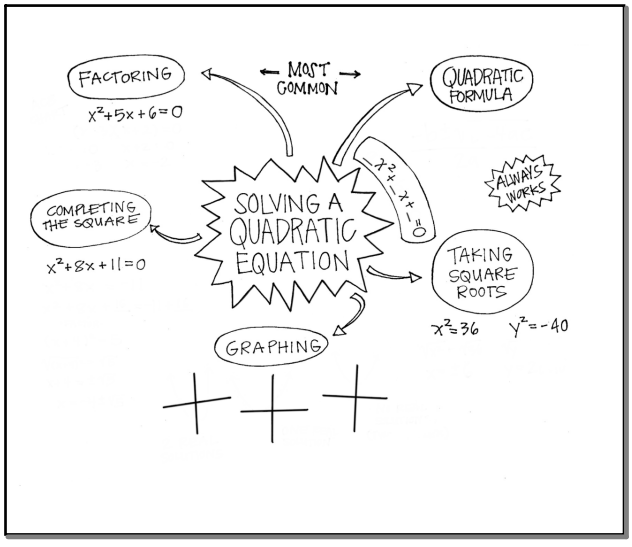
Part B **Explain why the median should be used instead of the mean. Write your answer in the space provided.**

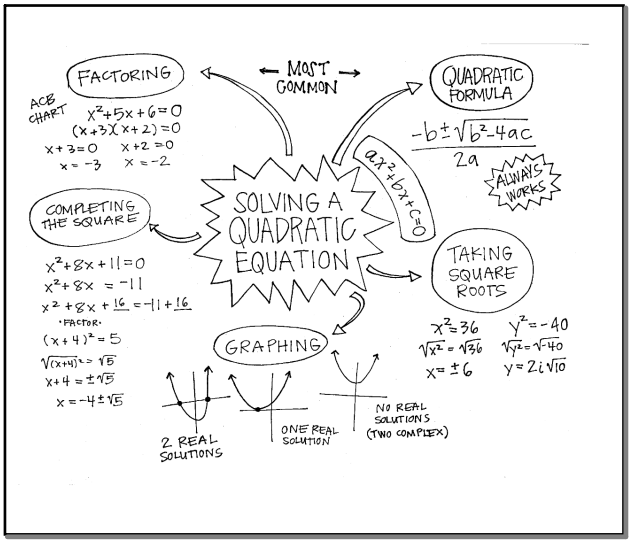
Part A _____

Part B

EOC released...close reading...so many details!

G.O. then quiz...




SOLVING A QUADRATIC EQUATION
FACTORING
← MOST COMMON →
QUADRATIC FORMULA
ACE CHART
$x^2+5x+6=0$
$(x+3)(x+2)=0$
$x+3=0$ $x+2=0$
$x=-3$ $x=-2$
$\frac{-b\pm\sqrt{b^2-4ac}}{2a}$
ALWAYS WORKS
$ax^2+bx+c=0$
COMPLETING THE SQUARE
$x^2+8x+11=0$
$x^2+8x=-11$
$x^2+8x+\underline{16}=-11+\underline{16}$
•FACTOR•
$(x+4)^2=5$
$\sqrt{(x+4)^2}=\sqrt{5}$
$x+4=\pm\sqrt{5}$
$x=-4\pm\sqrt{5}$
TAKING SQUARE ROOTS
$x^2=36$ $y^2=-40$
$\sqrt{x^2}=\sqrt{36}$ $\sqrt{y^2}=\sqrt{-40}$
$x=\pm6$ $y=2i\sqrt{10}$
GRAPHING
2 REAL SOLUTIONS
ONE REAL SOLUTION
NO REAL SOLUTIONS (TWO COMPLEX)