Quadratic Formula

Agenda

Warm-Up

Notes (Flip Book)

HW: Practice #1-10

Reminders

TEST Thursday!

No School Friday

English EOC next Tuesday!

Algebra Simulation Thursday 3/31

Warm-Up Monday

1. Write the following quadratic equation in standard form.

$y = ax^2 + bx + c$

$$y - 6 + 3x = 5x^2$$

$+6 \quad +6$

$y + 3x = 5x^2 + 6$

$-3x \quad -3x$

$y = 5x^2 - 3x + 6$

2. Find the solutions of $4x^2 + 16x = 0$

square root factor

$4x(x+4) = 0$

$\frac{4x}{4} = \frac{0}{4}$ $\quad x + 4 = 0$

$-4 \quad -4$

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

$\{0, -4\}$

Algebra I Simulation

NEXT Tuesday 3/29

Follow regular testing procedures! Your English EOC is 5 hours.

NEXT Thursday 3/31

Again, you will follow regular testing procedures. You need to ensure you BRING YOUR CALCULATOR, as there will not be many extras per room!!!

If you are not taking the English I STAAR or have taken Algebra I previously, please see Ms. K.

Quadratic Formula

Quadratic Formula: finds x-intercepts IF equation is in standard form ax^2+bx+c

ALWAYS WORKS!

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

b^2-4ac **Discriminant**

tells how many solutions (ONE, TWO, or NONE)

$b^2-4ac > 0$ (pos) 2 soln's

$b^2-4ac = 0$ one soln

$b^2-4ac < 0$ (neg) no soln

Using the discriminant, determine how many solutions exist.

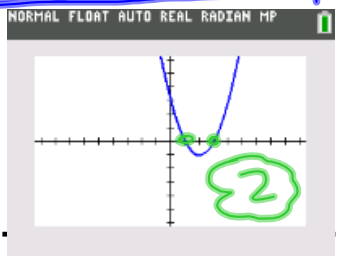
1. $x^2-4x+3=0$

$a=1$ $b=-4$ $c=3$

$b^2-4ac = (-4)^2-4(1)(3)$

4 pos.

2 solutions



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

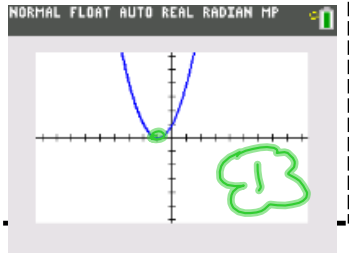
$+2x+1$ $+2x+1$

$x^2+2x+1=0$

a:1 b:2 c:1

$(2)^2-4(1)(1)=0$

one soln



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

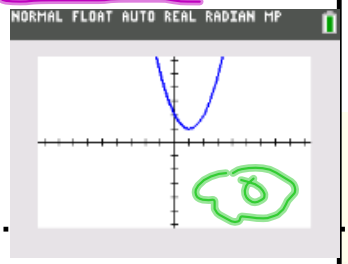
$-2x$ $-2x$

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

a:1 b:-2 c:2

$(-2)^2-4(1)(2)=-4$ neg.

No soln



Solve using the quadratic formula.

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

4. $2x^2=7x-3$

$-7x+3$ $-7x+3$

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

$a=2$ $b=-7$ $c=3$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2-4(2)(3)}}{2(2)}$$

$$x = \frac{7 \pm \sqrt{25}}{4} = \frac{7 \pm 5}{4}$$

$\frac{7+5}{4}$ OR $\frac{7-5}{4}$

$\{3, \frac{1}{2}\}$

5. $x^2-7-4x=0$

$x^2-4x-7=0$

$a=1$ $b=-4$ $c=-7$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2-4(1)(-7)}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{44}}{2}$$

Simplify $\sqrt{44} = \sqrt{4 \cdot 11} = \sqrt{4} \cdot \sqrt{11} = 2\sqrt{11}$

$$x = \frac{4 \pm 2\sqrt{11}}{2}$$

$\div 2$ $\div 2$

$x = 2 \pm \sqrt{11}$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Algebra I – Unit 8: Topic 3 – Solving Quadratics Using the Quadratic Formula

Practice - Solving Quadratics Using the Quadratic Formula

Name _____ Date _____ Period _____

Find the number of solutions for each equation using the discriminant. Show your work or draw the corresponding picture. TWO, ONE, NONE

1. $2x^2 - x = 21$

2. $5x^2 + 12x + 8 = 0$

3. $x^2 + 25 = 10x$

4. $4 = -16x^2 + 12x$

Solve the equations below using the Quadratic Formula. Simplify radical answers, if necessary.

5. $4x^2 + 7x = 15$

6. $10x^2 - 3x - 1 = 0$

Algebra I – Unit 8: Topic 3 – Solving Quadratics Using the Quadratic Formula

Solve the equations below using the Quadratic Formula. Simplify radical answers, if necessary.

7. $-z^2 + z = -14$

8. $8h^2 + 8 = 6 - 9h$

9. Which equation has solutions, rounded to the nearest tenth, of -2.1 and 2.4?

A. $3x^2 - x - 15 = 0$
B. $2x^2 - x - 15 = 0$
C. $3x^2 - 4x + 2 = 0$
D. $2x^2 - 4x + 2 = 0$

10. For the period 1990-2000, the amount of money, y (in billions of dollars) spent on advertising in the U.S. can be modeled by the function $y = 0.93x^2 + 2.2x + 130$, where x is the number of years since 1990. In what year was 164 billion dollars spent on advertising?

HW Help: Quadratic Formula

NO WORK = NO CREDIT = NO KIDDING!

#1-4. Solve each equation for 0 (move everything to one side), then look at the graph in your calculator. How many times does the graph touch the x-axis?

#5-8. Solve each equation for 0 (move everything to one side), then name your a, b, and c values. If you need to, change all the variables to x's. Plug each into the quadratic formula.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

If you do not get a square root that simplifies, you can leave it as a big fraction with the square root.

#9. Name your a,b,and c values for each answer choice and plug them into the quadratic formula. You round to ONE decimal.

#10. Plug in 164 for y. Make sure you subtract 164 from both sides before using the quadratic formula. You should get about 5 for x...what year does that represent?

Need extra help? Come to tutorials! TEST Thursday!

Solutions

1. Two
2. None
3. One
4. None
5. $x: \left\{\frac{5}{4}, -3\right\}$
6. $x: \left\{\frac{-1}{5}, \frac{1}{2}\right\}$
7. $x = \frac{-1 \pm \sqrt{57}}{-2}$
8. $x = \frac{-9 \pm \sqrt{17}}{16}$
9. A
10. 1995

HW Help: Quadratic Formula

NO WORK = NO CREDIT = NO KIDDING!

#1-4. Solve each equation for 0 (move everything to one side), then look at the graph in your calculator. How many times does the graph touch the x-axis?

#5-8. Solve each equation for 0 (move everything to one side), then name your a, b, and c values. If you need to, change all the variables to x's. Plug each into the quadratic formula.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

If you do not get a square root that simplifies, you can leave it as a big fraction with the square root.

#9. Name your a,b,and c values for each answer choice and plug them into the quadratic formula. You round to ONE decimal.

#10. Plug in 164 for y. Make sure you subtract 164 from both sides before using the quadratic formula. You should get about 5 for x...what year does that represent?

Need extra help? Come to tutorials! TEST Thursday!

Solutions

1. Two
2. None
3. One
4. None
5. $x: \left\{\frac{5}{4}, -3\right\}$
6. $x: \left\{\frac{-1}{5}, \frac{1}{2}\right\}$
7. $x = \frac{-1 \pm \sqrt{57}}{-2}$
8. $x = \frac{-9 \pm \sqrt{17}}{16}$
9. A
10. 1995