Quadratic Formula

Agenda

Warm-Up

HW Check

Notes (Flip Book)

HW: Practice #1-10

Reminders

Quiz Friday

HW 5.5 due Friday

English EOC (9th - Mon, 10th - Wed)

Algebra Simulation Tuesday 3/31

Warm-Up Wednesday

1. Write the following quadratic equation in standard form. $y-6+3x=5x^2$

ax^2+bx+c

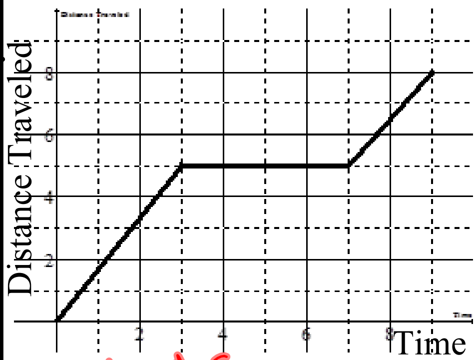
$+6 \quad +6$

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

$-3x \quad -3x$

$\boxed{y=5x^2-3x+6}$

2. Which situation best describes the following graph?



checked for accuracy

A. An airplane descends at a constant rate, levels off for a few minutes, and then continues to descend.

B. A man walks up a hill, walks along a flat road, and walks up another hill.

C. A ball is dropped from the top of a 3-story building.

D. A car traveling at a constant speed for a few minutes, stops at a red light, and then continues on at a constant rate.

Algebra I Simulation

2nd and 3rd period

Most of us will go to the freshmen gym at 8:55AM with your calculator and pencil. We will let you know if you are not in the gym. You will take your test until 12:30, then you will go to B-lunch. You will go to 5th-7th period as normal.

4th and 5th period

You will go to your 1st-3rd period as normal. YOU EAT A-LUNCH!!

Most of us will go to the freshmen gym at 12:30PM with your calculator and pencil. We will let you know if you are not in the gym. You will take your test until 4:10PM.

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

Questions, Comments, Concerns?

Algebra I – Unit 9: Topic 2 – Solving Quadratics by Using Square Roots

Practice - Solving Quadratics by Using Square Roots **pp 636-641**

Name ______________________ Date __________ Period _________

"What do you call a funny book about eggs?"

1. $x^2 = 81$
2. $4x^2 - 18 = -9$
3. $2x^2 + 7 = 207$
4. $5 - x^2 = 20$
5. $16x^2 + 10 = 131$
6. $81x^2 + 17 = 81$
7. $x^2 - 29 = 0$
8. $-3x^2 + 200 = 8$

L. $x = \pm\frac{2}{3}$

B. $x = \pm\sqrt{29}$

O. $x = \pm\frac{11}{4}$

K. No real solution

Y. $x = \pm 8$

E. $x = \pm\frac{8}{9}$

K. $x = \pm 9$

A. $x = \pm\frac{3}{2}$

S. $x = \pm\frac{4}{11}$

O. $x = \pm 10$

R. $x = 100$

___ ___ ___ ___ ___ ___ ___ ___ ___

2 8 5 1 6 7 5 3 4

Algebra I – Unit 9: Topic 2 – Solving Quadratics by Using Square Roots

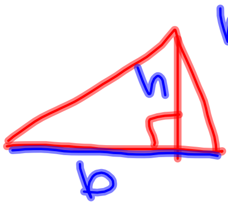
Solve using square roots.

9. $5(x-1)^2 = 180$

10. $16(x+5)^2 = 1024$

11. Carter plans to wallpaper the longest rectangular wall in his living room. The wall is twice as long as it is high and has an area of 162 square feet. What is the height of the wall?

12. The height of a triangle is twice the length of its base. The area of the triangle is 50 square meters. Find the height and base to the nearest tenth of a meter.



$h = 2b$

$A = \frac{bh}{2}$

$50 = \frac{b(2b)}{\cancel{2}}$

$\sqrt{50} = \sqrt{b^2}$

$\pm 7.1 = b$

base: 7.1m
height: 14.2m

13. Fenway Park is a Major League Baseball park in Boston, Massachusetts. The park offers seats on top of the left field wall. A person sitting in one of these seats accidentally drops his sunglasses on the field. The height, h (in feet), of the sunglasses can be modeled by the function $h = -16t^2 + 38$ where t is the time (in seconds) since the sunglasses were dropped. Find the time it takes for the sunglasses to reach the field. Round your answer to the nearest hundredth of a second.

on ground → height = 0

$0 = -16t^2 + \cancel{38}$

$-38 \qquad -\cancel{38}$

$\frac{-38}{-16} = \frac{-16t^2}{-16}$

$\sqrt{2.375} = \sqrt{t^2}$

$\boxed{1.54 \text{ seconds}}$

Quadratic Formula

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

a, b, c are #s

ü ALWAYS WORKS

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

→ discriminant b^2-4ac
- tells how many solutions

Using the discriminant, determine how many solutions exist. → calculate

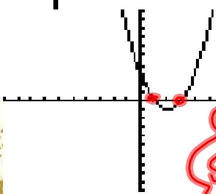
1. $x^2 - 4x + 3 = 0$

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

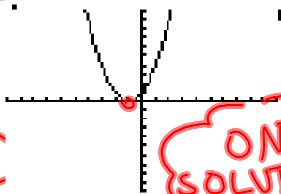
$b^2-4ac \Rightarrow (-4)^2-4(1)(3)$
$= 4$
positive

2. $x^2 = -2x - 1$
$+2x+1$ $+2x$ $+1$
$x^2+2x+1=0$
$a=1$ $b=2$ $c=1$
$b^2-4ac \Rightarrow (2)^2-4(1)(1)$
$=0$

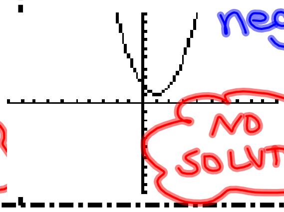
3. $x^2 + 2 = 2x$
$-2x$ $-2x$
$x^2-2x+2=0$
$a=1$ $b=-2$ $c=2$
$b^2-4ac \Rightarrow (-2)^2-4(1)(2)$
$=-4$
negative



TWO SOLUTIONS



ONE SOLUTION



NO SOLUTION

Solve using the quadratic formula.
*Must be in standard form

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

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

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

① Find b^2-4ac
$(-7)^2-4(2)(3)=25$

② Plug into whole formula.
$x=\frac{-(-7)\pm\sqrt{25}}{2(2)}$

③ Calculator → ALPHA Y= ENTER

④ Twice → once ⊕ once ⊖

$\boxed{3, \tfrac{1}{2}}$

5. $x^2 + 4x - 7 = 0$ ($2x^2 - 7 - 4x = 0$)

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

$(-4)^2-4(1)(-7)$
$=44$

$x=\frac{-(-4)\pm\sqrt{44}}{2(1)}$

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

HW #10

extra credit: parent signs sang quad form

Algebra I – Unit 9: Topic 3 – Solving Quadratics Using the Quadratic Formula

Practice - Solving Quadratics Using the Quadratic Formula **pp 652-659**

Name ______________________ Date __________ Period ________

Find the number of solutions for each equation using the discriminant. Show your work or draw the corresponding picture.

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. Round solutions to the nearest hundredth, if necessary.

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

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

Algebra I – Unit 9: Topic 3 – Solving Quadratics Using the Quadratic Formula

Solve the equations below using the Quadratic Formula. Round solutions to the nearest hundredth, if necessary.

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

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

9. A rectangle with an area of 91 square meters has dimension of (x+2) meters and (2x+3) meters. Solve for the dimensions of the rectangle. Round to the nearest tenth of a meter.

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 nice square root, you can leave it as a big fraction with the square root.

#9. Area = length x width. (x+2)(2x+3) = 91. You will need to multiply the binomials using the box or double distribution, then subtract 91 from both sides. You also cannot have a negative length, so only one x-value will work. Don't forget to plug your x back into both dimensions!

#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! Quiz Friday!