From the Teacher: K. Evans

Class: Algebra 1

Periods: 2 and 4

Assignment: Week 4

If turning in paper packet and work, make sure to include this header information on all pages!

From the Student:
Student Name
Teacher Name
Name of class
Period #
Assignment #

Distance Learning 2020 Week 4

Solving Quadratic Equations

Assignments are accessible in Microsoft Teams on Office 365. Work can also be submitted in Teams, which I highly encourage you to do if you are able to. You can contact Ms. Evans if you need help with Teams. You must write your name in pen on each page of your assignment.

The work in this packet is officially due 5/15/2020. I have broken down the work into daily chunks to help you manage your time. I encourage you to turn in assignments as you finish them.

My office hours are 1 pm – 3 pm, M–F. You can reach me through Remind (class code: @evans-alg1), email (kevans@tusd.net) or chat on Teams. Please continue to check your email regularly.

Ms. Evans will be holding a half hour meeting on Microsoft Teams to talk about the notes for the week and answer questions Monday and Wednesday. Check in Teams in the posts or the calendar to find the meeting time.

Week 4: Day 1 (turn in by 5/15/2020): Solve using square roots.

Read over notes on Solving Equations by Taking Square Roots (starts on page 4). Can also read the book, Explore & Explain 1 in 22.1 on p.1033–1035.

Assignment #1 is p.1039 #1-9, 23 (Skip graphing calculator part of instructions, and leave answers in simplified radical form not decimals when necessary)

Other resources that can help are

On Khan Academy

On Algeomulus Prep Academy (West High student made!)

https://youtu.be/RMwoe8sRYvg

https://youtu.be/2n9aMTiCfEc

https://youtu.be/qzK1DJ90Wsg

*If turning in work on Teams (which I highly encourage you to do if you are able to), you can do your assignment on binder paper and then upload a picture of it. Please write your name in pen on each page before you take a picture. Make sure your picture is clear and your work is readable.

Week 4: Day 2 (turn in by 5/15/2020): More Solving using square roots

Read over notes on Solving using Square Roots – Part 2 (starts on page 7). Can also read the book, Explain 2 in 22.1 on p.1036.

Assignment #2 is p.1040 #10-15, 22 (Leave answers in simplified radical form not decimals when necessary)

Other resources that can help are

On Khan Academy

https://youtu.be/2n9aMTiCfEc?t=87

https://youtu.be/RMwoe8sRYvg?t=121

Week 4: Day 3 (turn in by 5/15/2020): Quadratic Formula

Read over notes on Using the Quadratic Formula to Solve Equations (starts on page 9). Can also read the book, Explain 2 in 22.3 on p.1061–1062

Assignment #3 is p.1068 #9-14

Other resources that can help are

On Khan Academy (Two videos can be found on this link)

On Algeomulus Prep Academy (West High student made!)

https://youtu.be/3ayhvAI3IeY

https://youtu.be/s80J2dAUUyI

Week 4: Day 4 (turn in by 5/15/2020): More Quadratic Formula

Assignment #4 is Quadratic Formula Practice worksheet (on page 3)

Week 4: Day 5 (turn in by 5/15/2020): Choosing Method to solve with

Read over notes on Choosing a Method for Solving Quadratic Equations (starts on page 12).

Assignment #5 is p.1082 #2-10, 12, 14, 15

Quadratic Formula Practice (Week 4 Assignment #4) **Algebra 1**

Solve each equation using the quadratic formula. Leave answers as simplified radicals if necessary.

1. $5x^2 + 6x - 4 = 0$
2. $11n^2 - 7n + 4 = 0$
3. $6v^2 - v - 85 = -8$
4. $11x^2 - 4x - 29 = -12$
5. $x^2 - 11x = -12$
6. $6v^2 + 4v = 130$
7. $2x^2 - 6 = 5x$
8. $3x^2 - 16 = 11x$

Solving Equations by Taking Square Roots

To Solve using square roots we need to remember how to simplify a square root

The square root of a nonnegative number a is the real number b such that $b^2 = a$

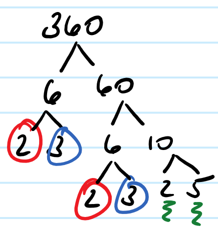
$\sqrt{16} = 4$ or -4 since $4^2 = 16$ and $(-4)^2 = 16$

☆ So, Every positive number has 2 square roots, 1 positive & 1 negative

We simplified square roots before using a factor tree to help us out

Ex $\sqrt{360}$ Since 360 is not a perfect square should simplify

Make a factor tree for 360 (breaking down to primes)



2, 3, and 5 are all prime #s so stop there

looking for pairs! Pairs send a representative outside $\sqrt{\ }$
Singletons stay behind (under $\sqrt{\ }$)

$2 \cdot 3\sqrt{2 \cdot 5}$

$= 6\sqrt{10}$

☆ Remember $\sqrt[6]{10}$ means something completely different so be careful how you write it!!

Properties of Radicals (Remember $\sqrt{\ }$ is a radical symbol because can change from a square root to a different root by adding a #)

Product Property of Radicals

For $a \geq 0$ & $b \geq 0$, $\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$ ☆ don't use much since use tree to simplify.

Quotient Property of Radicals

For $a \geq 0$ & $b > 0$, $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$ ☆ So to take the square root of a fraction, square root top & square root bottom!

Ex $\sqrt{4/9} = \sqrt{4}/\sqrt{9} = 2/3$

☆ With fractions, we do NOT leave a $\sqrt{\ }$ in the denominator!

if we have $\sqrt{\frac{4}{3}} = \frac{\sqrt{4}}{\sqrt{3}} = \frac{2}{\sqrt{3}}$. In math this is just not done!

So we have to Rationalize the Denominator

Rationalize the Denominator - rewrite a fraction with a square root in the denominator without one.

$\frac{2}{\sqrt{3}}$

☆ We can multiply a numerator AND denominator of a fraction by the same number and not change the value of the fraction

We need something to make $\sqrt{3}$ a perfect square (like $\sqrt{9}$)!

So to make 3 into 9 need to multiply by 3 (itself!)

$\frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{\sqrt{3 \cdot 3}}$ ⇐ Product Property of radicals applied ($\sqrt{3} \cdot \sqrt{3} = \sqrt{3 \cdot 3}$)

$= \frac{2\sqrt{3}}{\sqrt{9}}$ $\sqrt{9} = 3$!

$= \frac{2\sqrt{3}}{3}$ ☆ You can not "cancel" the 3 since one is under $\sqrt{\ }$ and one is not.

A few more examples:

$\sqrt{8/7} = \frac{\sqrt{8}}{\sqrt{7}}$ Simplify $\sqrt{8}$ 8 → 2, 4 → (2 2) $2\sqrt{2}$ Can't simplify $\sqrt{7}$

$\frac{2\sqrt{2}}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}}$ ☆ can't leave $\sqrt{7}$ in denominator so rationalize it!

$\frac{2\sqrt{2 \cdot 7}}{\sqrt{7 \cdot 7}}$ $= \sqrt{49} = 7$! ☆ applying the product property $\sqrt{a} \cdot \sqrt{b} = \sqrt{ab}$

$\frac{2\sqrt{14}}{7}$ ☆ can't simplify anything since 14 is under $\sqrt{\ }$ and 7 is not!

$\frac{6}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$ ☆ can't leave $\sqrt{2}$ in denominator so rationalize!

$\frac{6\sqrt{2}}{\sqrt{2 \cdot 2}} = \frac{6\sqrt{2}}{\sqrt{4}} = \frac{6\sqrt{2}}{2}$ ☆ Not done! We can simplify $\frac{6}{2}$ since both are not under $\sqrt{\ }$

$\frac{\cancel{6}^{3}\sqrt{2}}{\cancel{2}_{1}}$ 2 goes into both!

$= 3\sqrt{2}$

Now that we can simplify square roots when necessary and rationalize the denominator we are redy to solve equations using square roots!

☆ undoing the square requires having the item being squared by itself

$x^2 = 4$ not $7x^2 = 28$!

Ex Solve the equation. Give the answer in radical form when necessary.
(meaning simplify $\sqrt{\ }$ when necessary, no decimals!) this is slightly different from book instructions

a $3x^2-7=2$

$+7 \quad +7$ ★ get x^2 by itself just like you would solve for x if it was $3x-7=2$!

$\frac{3x^2}{3}=\frac{9}{3}$

$\sqrt{x^2}=\sqrt{3}$ ★ to "undo" square, square root both sides

$\sqrt{x^2}=x$ since you square x to get x^2 like $\sqrt{16}=4$ since $4^2=16$

$x=\pm\sqrt{3}$

★ at the start we saw ever $\sqrt{\ }$ has 2 answers (1+, 1-)
so when take $\sqrt{\ }$ of both sides we MUST put $\pm$ (plus-minus)

± 3 is the short way to say $+3$ and -3!

b $4x^2-10=90$ ★ get x^2 by itself

$+10 \quad +10$

$\frac{4x^2}{4}=\frac{100}{4}$

$\sqrt{x^2}=\sqrt{25}$ ★ $\sqrt{\ }$ both sides to get x and not x^2

$x=\pm 5$ ★ remember to add $\pm$!

c $2x^2+6=60$ ★ get x^2 by itself

$-6 \quad -6$

$\frac{2x^2}{2}=\frac{54}{2}$

$\sqrt{x^2}=\sqrt{27}$ ★ $\sqrt{\ }$ both sides to get rid of ^{2} (square!)

$x=\pm\sqrt{27}$ ★ remember $\pm$. Now simplify $\sqrt{27}$ if can

27
3 9
3 3

$x=\pm 3\sqrt{3}$

d $5x^2-9=2$

$+9 \quad +9$

$\frac{5x^2}{5}=\frac{11}{5}$

$\sqrt{x^2}=\sqrt{11/5} \rightarrow \frac{\sqrt{11}}{\sqrt{5}}\cdot\frac{\sqrt{5}}{\sqrt{5}}$ Need to rationalize denominator!

$x=\pm\frac{\sqrt{55}}{5}$ $=\frac{\sqrt{55}}{\sqrt{25}}=\frac{\sqrt{55}}{5}$

$\sqrt{11}\cdot\sqrt{5}=\sqrt{11\cdot 5}=\sqrt{55}$

$\sqrt{5}\cdot\sqrt{5}=\sqrt{5\cdot 5}=\sqrt{25}$

★ Remember: Can NOT take the square root of a negative number
(no way to square a # & get a negative!)

So if get $\sqrt{x^2}=\sqrt{-3}$

can't do! So No Solution!

Solving using Square Roots - Part 2

Solving a quadratic equation may involve isolating the squared part of a quadratic equation on one side of the equation first.

☆ As long as the only variable in the equation is in the squared term then the equation can be solved using square roots.

Can Solve using Square Root

→ $3x^2+7=24$
→ $2(x+4)^2=15$
→ $-3(x-2)^2+11=-1$

x is only inside squared part so ok!

Cannot solve using square root

→ $3x^2+4x+7=0$
→ $2(x+4)^2-2x=7$

☆ the x separate from x^2 and $(\,)^2$ keeps us from using $\sqrt{\ }$ to solve the equation

Ex Solve the equation. Give answers in simplified radical form when necessary.
(meaning simplify $\sqrt{\ }$ when necessary, no decimals!) this is slightly different from book instructions.

a $\sqrt{(x-3)^2}=\sqrt{36}$ ☆ $(\,)^2$ is already by itself so "undo" square by taking square root of both sides.

$x-3=\pm 6$ $\sqrt{(x-3)^2}=x-3$ since $(x-3)$ squared $=(x-3)^2$!
$+3 \quad +3$ Took square root of both sides so add $\pm$ to the 6

$x=3\pm 6$ ☆ now Solve for x!
$3+6$ or $3-6$ this is really two answers and since 6 & 3 are like terms we must combine

$x=9$ or -3

b $\dfrac{7(x+4)^2}{7}=\dfrac{35}{7}$ ☆ isolate $(\,)^2$ since have 7 times $(\,)^2$, divide to move 7

$\sqrt{(x+4)^2}=\sqrt{5}$ ☆ $\sqrt{\ }$ both sides to "undo" square

$x+4=\pm\sqrt{5}$ ☆ don't forget $\pm$ since $\sqrt{\ }$ both sides
$-4 \quad -4$ ☆ Solve for x

$x=-4\pm\sqrt{5}$ since can't combine -4 & $\sqrt{5}$ leave as is
But there are two answers here
$-4+\sqrt{5}$ and $-4-\sqrt{5}$

c $2(x-3)^2+4=-28$ ☆ isolate $(\,)^2$
$-4 \quad -4$

$\dfrac{2(x-3)^2}{2}=\dfrac{-32}{2}$

$\sqrt{(x-3)^2}=\sqrt{-16}$ ☆ $\sqrt{\ }$ both sides

Can not take the square root of a negative number

No Solution

d. $4(x+10)^2 - 3 = 45$ ☆ isolate $()^2$

$\quad\quad +3 \quad +3$

$\dfrac{4(x+10)^2}{4} = \dfrac{48}{4}$

$\sqrt{(x+10)^2} = \sqrt{12}$ ☆ $\sqrt{\ }$ both sides

$x+10 = \pm 2\sqrt{3}$ ☆ Remember $\pm$ and simplify $\sqrt{12}$

$\quad -10 \quad -10$

12
2 6
2 3

$x = -10 \pm 2\sqrt{3}$ ☆ get x by itself

Can not combine 10 & 2 since 2 is not by itself it is $2\sqrt{3}$

e. $\dfrac{-2(x-9)^2}{-2} = \dfrac{-128}{-2}$

$\sqrt{(x-9)^2} = \sqrt{64}$

$x-9 = \pm 8$

$\quad +9 \quad +9$

$x = 9 \pm 8$ since can combine 8 & 9, separate and simplify

$9+8 \quad 9-8$

$x = 17$ or 1

Using the Quadratic Formula to Solve Equations

So far we have learned several ways to solve a quadratic equation

Graphing
Factoring
Using Square Roots

But all 3 have their limitations

One method that has no limitations is using the quadratic formula

To solve $ax^2+bx+c=0$, you can use the

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

A few things about using the quadratic formula

→ equation must $=0$ to get values of a, b, and c

★ So if equation is not in standard form $(ax^2+bx+c=0)$ then must rewrite it

→ get rid of any ( )
→ move terms to one side (preferable for x^2 term to be positive)

→ remember it is possible for b and/or c to be 0

$3x^2-4=0 \Rightarrow a=3 \quad b=0 \quad c=-4$ $b=0$ since no x term

$x^2+5x=0 \Rightarrow a=1 \quad b=5 \quad c=0$ $c=0$ since no constant term (term without x)

$4x^2=0 \Rightarrow a=4 \quad b=0 \quad c=0$ since no x term or constant term

Just like with solving using square roots we will leave answers in simplified radical form.

Ex Solve using the quadratic formula.

a $2x^2+3x-1=0$ ★ already $=0$, so identify a, b, and c and plug into formula $\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$a=2 \quad b=3 \quad c=-1$

$$x=\frac{-3\pm\sqrt{(3)^2-4(2)(-1)}}{2(2)}$$

★ Simplify following order of operations (everything under $\sqrt{\ }$ first!)

$$=\frac{-3\pm\sqrt{9+8}}{4}$$

$$=\frac{-3\pm\sqrt{17}}{4}$$

★ can't simplify $\sqrt{17}$ so done!

Remember ± says 2 answers here $\frac{-3+\sqrt{17}}{4}$ & $\frac{-3-\sqrt{17}}{4}$

b) $3x^2 + 2x - 21 = 0$ ☆ already in standard form (=0) so identify a, b, & c and plug into quadratic formula

$a=3 \quad b=2 \quad c=-21$

$$x = \frac{-2 \pm \sqrt{(2)^2 - 4(3)(-21)}}{2(3)}$$

☆ Simplify

$$= \frac{-2 \pm \sqrt{4 + 252}}{6}$$

$$= \frac{-2 \pm \sqrt{256}}{6}$$

$$= \frac{-2 \pm 16}{6}$$

☆ Since $\sqrt{256} = 16$ (a whole number) seperate answers and simplify (like did when solving using square roots)

$$x = \frac{-2+16}{6} \quad \text{or} \quad x = \frac{-2-16}{6}$$

$$= \frac{14}{6} \qquad = -18/6$$

$$x = 7/3 \quad \text{or} \quad x = -3$$

c) $2x = x^2 - 4$ ☆ not standard form, so need to rewrite into standard form (=0)

$-2x \quad -2x$

$0 = x^2 - 2x - 4$ ☆ identify a, b, and c and plug into quadratic formula

$a=1 \quad b=-2 \quad c=-4$

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

☆ Simplify

$$= \frac{2 \pm \sqrt{4 + 16}}{2}$$

$$= \frac{2 \pm \sqrt{20}}{2}$$

☆ Simplify $\sqrt{20}$

20
2 10
2 5

$= 2\sqrt{5}$

$$= \frac{2 \pm 2\sqrt{5}}{2}$$

☆ to simplify this fraction looking at 3 numbers $\frac{\# \pm \# \sqrt{\#}}{\#}$

if something goes into ALL 3 can simplify!

2 goes into all 3 so divide all 3 by 2

$$= \frac{1 \pm 1\sqrt{5}}{1}$$

☆ don't need to write 1 in denominator or 1 in front of $\sqrt{\ }$

$$x = 1 \pm \sqrt{5}$$

d $4x^2+25=-20x$ ☆ rewrite into standard form

$+20x \quad +20x$

$4x^2+20x+25=0$ ☆ identify a, b, and c and plug into quadratic formula

$a=4 \quad b=20 \quad c=25$

$x=\frac{-20\pm\sqrt{(20)^2-4(4)(25)}}{2(4)}$ ☆ Simplify.

$=\frac{-20\pm\sqrt{400-400}}{8}$

$=\frac{-20\pm\sqrt{0}}{8}$ ☆ Since $\sqrt{0}=0$ and $-20+0$ & $-20-0$ are both -20, there is only ONE solution

$=-20/8$

$x=\underline{-5/2}$

e $x^2-6x-7=0$

$a=1 \quad b=-6 \quad c=-7$

$x=\frac{-(-6)\pm\sqrt{(-6)^2-4(1)(-7)}}{2(1)}$

$=\frac{6\pm\sqrt{36+28}}{2}$

$=\frac{6\pm\sqrt{64}}{2}$

$=\frac{6\pm 8}{2}$ ☆ Since $\sqrt{64}=8$, separate answers and simplify

$x=\frac{6+8}{2}$ or $x=\frac{6-8}{2}$

$=\frac{14}{2} \qquad =\frac{-2}{2}$

$x=\underline{7 \text{ or } -1}$

f $2x^2=5x-7$ ☆ Rewrite into standard form!

$-5x+7 \quad -5x \quad +7$

$2x^2-5x+7=0$ ☆ Solve...

$a=2 \quad b=-5 \quad c=7$

$x=\frac{-(-5)\pm\sqrt{(-5)^2-4(2)(7)}}{2(2)}$

$=\frac{5\pm\sqrt{25-56}}{4}$

$=\frac{5\pm\sqrt{-31}}{4}$ ☆ CanNOT take the square root!!!

No Solution

Choosing a Method for Solving Quadratic Equations

We have learned 4 ways to solve a Quadratic Equation:

1) Graphing
   ⇒ must graph and if answers are fractions or irrational (still have a $\sqrt{\ }$) it is hard to get accurate answers

2) Factoring
   ⇒ must make $=0$ then factor, but not all polynomials can be factored

3) Using Square Roots
   ⇒ Can only have x^2 or $(\ )^2$ no x term!

4) Quadratic Formula
   ⇒ Works every time, but not always most efficient!

<u>Ex</u> Solve the quadratic equation by any means
⇒ You pick one of 4 methods, can be different for different problems

<u>a</u> $7x^2-3x-5=0$

☆ Can't use square roots (have $-3x$ term)

☆ Can it factor?

$-35x^2$

$-3x$

$1x \quad -35x$
$7x \quad -5x$

only pairs that multiply to make $-35x^2$ and none add up to $-3x$

So No!

☆ Since can't factor or use square roots, quadratic formula it is.

$a=7 \quad b=-3 \quad c=-5$

$$x=\frac{3\pm\sqrt{(-3)^2-4(7)(-5)}}{2(7)}$$

$$=\frac{3\pm\sqrt{9+140}}{14}$$

$$\underline{x=\frac{3\pm\sqrt{149}}{14}}$$

149
$\wedge$ 149 is prime, so can't simplify

<u>b</u> $x^2+7x+6=0$

☆ can't use square roots since has $7x$ term

☆ factor?

$6x^2$

$1x \quad 6x$

$7x$

$1x \quad 6x$ sums to $7x$!
Yes, so factor completely

	x	1
x	x^2	$1x$
6	$6x$	6

$(x+1)(x+6)=0$

☆ apply zero product property and solve new equations

$x+1=0 \qquad x+6=0$
$-1 \ \ -1 \qquad -6 \ \ -6$

$\underline{x=-1 \text{ or } x=-6}$

c $9x^2 - 100 = 0$

$+100 \quad +100$

★ No x term so can use square roots (get x^2 by self & $\sqrt{\ }$ both sides)

$\frac{9x^2}{9} = \frac{100}{9}$

$\sqrt{x^2} = \sqrt{\frac{100}{9}}$

$x = \pm \frac{10}{3}$

★ don't forget $\pm$ when $\sqrt{\ }$ both sides!

d $2x^2 + 8x = -3$

$+3 \quad +3$

$2x^2 + 8x + 3 = 0$

★ can't use $\sqrt{\ }$ since has $8x$ term
make $= 0$ since needed for factoring or quadratic formula

★ can it be factored? $6x^2$ / $8x$

$1x \quad 6x$
$2x \quad 3x$

None of pairs that multiply to get $6x^2$ add up to $8x$
So Can NOT factor

★ Can't factor so on to Quadratic formula

$a = 2 \quad b = 8 \quad c = 3$

$x = \frac{-8 \pm \sqrt{8^2 - 4(2)(3)}}{2(2)}$

$= \frac{-8 \pm \sqrt{64 - 24}}{4}$

$= \frac{-8 \pm \sqrt{40}}{4}$

40
4 10
2 2 2 5

$= 2\sqrt{2 \cdot 5}$
$= 2\sqrt{10}$

$= \frac{-8 \pm 2\sqrt{10}}{4}$

$-8, 2, 4 \Rightarrow$ 2 goes into all 3 #s so divide all by 2

$x = \frac{-4 \pm \sqrt{10}}{2}$

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

★ No square root

★ Factor? $-7x^2$ / $4x$

$-1x \quad 7x \Rightarrow 6x$ No, can't factor!

★ So Quadratic formula

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

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

$= \frac{-4 \pm \sqrt{16 + 28}}{2}$

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

44
4 11
2 2

$= 2\sqrt{11}$

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

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

f $3(x-4)^2+2=26$ ☆ Can use square roots since variable only happens inside $(\ )^2$

$$\begin{aligned} 3(x-4)^2+2&=26\\ -2\quad&\ \ -2\\ \frac{3(x-4)^2}{3}&=\frac{24}{3}\\ \sqrt{(x-4)^2}&=\sqrt{8}\\ x-4&=\pm 2\sqrt{2}\\ +4\quad&\ \ +4\\ x&=4\pm 2\sqrt{2}\end{aligned}$$

$8 = 2 \cdot 4 = 2 \cdot 2 \cdot 2$ $= 2\sqrt{2}$

☆ don't forget $\pm$!!!

☆ Rember every one of these problems could have been done using the quadratic formula, but it might have taken longer

in f, would have had to multiplied out into standard form (Week 1) then applied the quadratic formula (definitely more complicated!)

if did c by quadratic formula would look like

$9x^2-100=0$

$a=9 \quad b=0 \quad c=-100$

$$x=\frac{0\pm\sqrt{0^2-4(9)(-100)}}{2(9)}$$

$$=\frac{\pm\sqrt{3600}}{18}$$

$$=\pm\frac{60}{18}\begin{matrix}\div 6\\ \div 6\end{matrix}$$

$$x=\pm\frac{10}{3}$$

Could have factored c as well! it is a difference of 2 squares!

$$9x^2-100=0$$
$$(3x)^2-(10)^2=0$$
$$(3x+10)(3x-10)=0$$

$$3x+10=0 \qquad 3x-10=0$$
$$-10\ \ -10 \qquad +10\ \ +10$$
$$\frac{3x}{3}=\frac{-10}{3} \qquad \frac{3x}{3}=\frac{10}{3}$$

$$x=-10/3 \text{ or } 10/3$$