

SLO Pre-Test Quadratics
 10 points participation for taking

Dec 2-8:49 AM

Calendar Math
 Complex numbers:
 imaginary solutions
 it will have an i
 Standard form:
 $\sqrt{-1} = i$
 $\sqrt{-1}^2 = i^2$
 $-1 = i^2$

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Add: $(3+2i) + (5-4i)$
 $8-2i$
 Combine like terms
 Subtract: $(7-5i) - (-2+6i)$
 $7-5i+2-6i$

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Homework 5.1
 $(30) r \cdot 2r^{-2}$
 $r^1 \cdot r^{-2}$
 $r^{1+(-2)}$
 $2r^{-1}$
 $\frac{2}{r}$

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$2\sqrt{10}$ $-4\sqrt{6}$ $-5\sqrt{2}$

$-8\sqrt{60}$	$-10\sqrt{20}$
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 $-8\sqrt{60} - 10\sqrt{20}$
 $3 \cdot 2 \cdot 2 \cdot 5$ $2 \cdot 2 \cdot 5$
 $-16\sqrt{15} - 20\sqrt{5}$

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5.3/5.4 Discriminants and the Quadratic Formula
 The quadratic formula, $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$, can be used to find the solutions of the quadratic equation $ax^2 + bx + c = 0$, when $a \neq 0$, it is most useful when a function is not factorable. The radicand of the quadratic formula, $b^2 - 4ac$, is called the **discriminant**. It can be used to determine the number and type of solutions to the quadratic equation $ax^2 + bx + c = 0$.
 Discriminant
 $b^2 - 4ac$
 $a =$ $b =$ $c =$

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Discriminant the part under the root in the quadratic formula.
Remember if a square root is negative the solution will have i in it.
That means it is an imaginary solution and does not cross the x -axis.

10+
-10-

- If $b^2 - 4ac > 0$, then there are two real solutions to the quadratic equation, and the graph crosses at each x -intercept. *2 real solutions x-int*
- If $b^2 - 4ac = 0$, then there is one real solution to the quadratic equation, and the graph touches at one x -intercept. *1 real solution touch x-axis*
- If $b^2 - 4ac < 0$, then there are no real, but two imaginary solutions to the quadratic equation, and the graph never touches the x -axis. *2 imaginary solutions no x-axis*

$x^2 + 54$

$(x+2i)(x-2i)$

x^2	$2xi$
$-2xi$	$-4i^2$

$x = 2i$
 $x = -2i$

$x^2 - 4(-1)$
 $x^2 + 4$

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Determine the number and type of solutions using the discriminant for the equations below.

a) $x^2 - 9x - 10 = 0$
 $a=1$ $b=-9$ $c=-10$
 $b^2 - 4ac$
 $(-9)^2 - 4(1)(-10)$
 $|2| = \text{discriminant}$
2 real solutions

b) $-9x^2 - 6x - 1 = 0$
 $a=-9$ $b=-6$ $c=-1$
 $(-6)^2 - 4(-9)(-1)$
 discriminant = 0
1 real solution

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The Quadratic Formula Song

Sing to the tune of "pop goes the weasel!"

First you take a negative b , plus or minus square root, of b squared minus $4ac$, all over $2a$.

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Quadratic Formula:

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

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- Step 1: Set one side of the equation equal to zero.
- Step 2: Write down a , b , c
- Step 3: Plug into the formula. Simplify the root if possible. Reduce if all three numbers will divide evenly by the same number.
- Step 4: Write your answer as two separate answers.

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④ $6m^2 - 10m - 16 = 0$
 $a=6$ $b=-10$ $c=-16$
 $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(6)(-16)}}{2(6)}$
 $x = \frac{10 \pm \sqrt{484}}{12}$ (22)
 $x = \frac{10 \pm 22}{12}$
 $x = \frac{5 \pm 11}{6}$
 $x = \frac{(5+11)}{6}$ $x = \frac{(5-11)}{6}$
 $x = \frac{16}{6}$ **$x = -1$**

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d) $-4 = -6r^2 - 2r$

⑤ $6r^2 + 2r - 4 = 0$

$a=6$ $b=2$ $c=-4$

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

$$X = \frac{-2 \pm \sqrt{(2)^2 - 4(6)(-4)}}{2(6)}$$

$$X = \frac{-2 \pm \sqrt{100}}{12}$$

$$X = \frac{-2 \pm 10}{12}$$

$$X = \frac{-1 \pm 5}{6} \quad X = \frac{-1 - 5}{6}$$

$$X = \frac{-1 + 5}{6} \quad \boxed{X = -1}$$

$$\boxed{X = \frac{2}{3}}$$

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