Lesson 15: Using the Quadratic Formula

Classwork

Opening Exercises

Solve the following:

1. $4x^{2}+5x+3=2x^{2}-3x$
2. $c^{2}-14=5c$

**Exercises**

Solve Exercises 1–5 using the quadratic formula.

1. $x^{2}-2x+1=0$
2. $3b^{2}+4b+8=0$
3. $2t^{2}+7t-4=0$
4. $q^{2}-2q-1=0$
5. $m^{2}-4=3$

For Exercises 6–9, determine the number of real solutions for each quadratic equation without solving.

1. $p^{2}+7p+33=8-3p$
2. $7x^{2}+2x+5=0$
3. $2y^{2}+10y=y^{2}+4y-3$
4. $4z^{2}+9=-4z$
5. On the line below each graph, state whether the discriminant of each quadratic equation is positive, negative, or equal to zero. Then, identify which graph matches the discriminants below.

Graph 1 Graph 2 Graph 3 Graph 4

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| Discriminant A:$$\left(-2\right)^{2}-4\left(1\right)\left(2\right)$$Graph: \_\_\_\_\_\_ | Discriminant B:$$\left(-4\right)^{2}-4\left(-1\right)\left(-4\right)$$Graph: \_\_\_\_\_\_ | Discriminant C:$$\left(-4\right)^{2}-4\left(1\right)\left(0\right)$$Graph: \_\_\_\_\_\_ | Discriminant D:$$ \left(-8\right)^{2}-4\left(-1\right)\left(-13\right)$$Graph: \_\_\_\_\_\_ |

Problem Set

Lesson Summary

You can use the sign of the discriminant, $b^{2}-4ac$, to determine the number of real solutions to a quadratic equation in the form $ax^{2}+bx+c=0$, where $a\ne 0$. If the equation has a positive discriminant, there are two real solutions. A negative discriminant yields no real solutions, and a discriminant equal to zero yields only one real solution.

Without solving, determine the number of real solutions for each quadratic equation.

1. $b^{2}-4b+3=0$
2. $2n^{2}+7=-4n+5$
3. $x-3x^{2}=5+2x-x^{2}$
4. $4q+7=q^{2}-5q+1$

****Based on the graph of each quadratic function,$ y=f(x)$, determine the number of real solutions for each corresponding quadratic equation, $f(x)=0$.

1. 6.
2. ** 8.