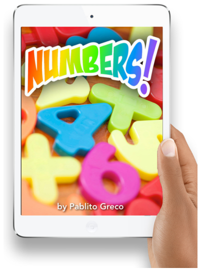
Ready, Set, Go!



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Ready

Topic: Attributes of quadratics and other functions

1. Summarize what you have learned about quadratic functions to this point. In addition to your written explanation provide graphs, tables and examples to illustrate what you know.

2. In prior work you have learned a great deal about both linear and exponential functions. Compare and contrast linear and exponential functions with quadratic functions. What similarities if any are there and what differences are there between linear, exponential and quadratic functions?

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Set

Topic: Operations on different types of numbers

3. The Natural numbers, $\mathbb{N}$, are just that the numbers that come naturally or the counting numbers. As any child first learns numbers they learn 1, 2, 3, … What operations on the Natural numbers would cause the need for other types of numbers? What operation on Natural numbers create a need for Integers or Rational numbers and so forth. (Give examples and explain.)

In each of the problems below use the given items to determine whether or not it is possible *always*, *sometimes* or *never* to create a new element* **that is in the desired set.**

4. Using the operation of addition and elements from the Integers, $\mathbb{Z}$, [always, sometime, never] an element of the Irrational numbers, $\overline{\mathbb{Q}}$, will be created. Explain.

5. Consider the equation $a - b = c$, where $a \in \mathbb{N}$ and $b \in \mathbb{N}$, c will be an Integer, $\mathbb{Z}$ [always, sometimes, never]. Explain.

6. Consider the equation $a \div b = c$, where $a \in \mathbb{Z}$ and $b \in \mathbb{Z}$, then is $c \in \mathbb{Z}$ [sometimes, always, never]. Explain.

**The numbers in any given set of numbers may be referred to as elements of the set. For example, the Rational number set, $\mathbb{Q}$, contains elements or numbers that can be written in the form $\frac{a}{b}$, where a and b are integer values ($b \neq 0$).*

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7. Using the operation of subtraction and elements from the Irrationals, $\overline{\mathbb{Q}}$, an element of the Irrational numbers, $\overline{\mathbb{Q}}$, will be created [always, sometime, never]. Explain.

8. If two Complex numbers, $\mathbb{C}$, are subtracted the result will [always, sometimes, never] be a Complex number, $\mathbb{C}$. Explain.

Go

Topic: Solving all types of Quadratic Equations, Simplifying Radicals

Make a prediction as to the nature **of the solutions for each quadratic (Real, Complex, Integer, etc.) then solve each of the quadratic equations below using an appropriate and efficient method. Give the solutions and compare to your prediction.**

9. $-5x^2 + 3x + 2 = 0$

Prediction:

Solutions:

10. $x^2 + 3x + 2 = 0$

Prediction:

Solutions:

11. $x^2 + 3x - 12 = 0$

Prediction:

Solutions:

12. $4x^2 - 19x - 5 = 0$

Prediction:

Solutions:

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Simplify each of the radical expressions. Use rational exponents if desired.

13. $\sqrt[4]{81x^8y^{12}}$

14. $\sqrt{\frac{a^7b^{10}}{a^3}}$

15. $\sqrt[5]{625x^{12}}$

16. $(\sqrt{n})^5$

17. $\sqrt[3]{-27}$

18. $(\sqrt{8})(\sqrt{3^2})(2)$

Fill in the table so each expression is written in radical form and with rational exponents.

	Radical Form	Exponential Form
19.	$\sqrt[4]{8^3}$	
20.		$256^{\frac{3}{4}}$
21.	$\sqrt[4]{2^7 \bullet 4^5}$	
22.		$16^{\frac{3}{2}} \bullet 4^{\frac{1}{2}}$
23.	$\sqrt[10]{x^{23}y^{31}}$	
24.	$\sqrt[5]{64a^9b^{18}}$	

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