1.1: Apply Properties of Real Numbers
"I WILL …
Study and evaluate properties of real numbers."

I. What is a number?

    A. According to M–W.com (Merriam–Webster Dictionary), it means "a word,

       symbol, letter, or combination of symbols represented"

    B. Etymology: Middle English *nombre,* from Anglo–French, from Latin *numerous*

    C. Definition:

II. Types of Numbers.

    A. _____ are numbers can be expressed using set notation.

       They are also known as _____ KINDERGARDEN;

       NATURALLY COUNT NUMBERS

    B. If we include a ZERO we have the set of _____. 1ST

       GRADE; HOLE = ZERO

    C. Include the OPPOSITES of the whole numbers and you have the set of

       _____. PRE–ALGEBRA

    D. _____can be expressed as a QUOTIENT (or ratio) of two

       integers, where the denominator is _____ ZERO. The decimal form of a

       rational number either terminates or repeats. RATIO. CAN I WRITE THIS AS

       A FRACTION?

    E. _____ cannot be expressed as a quotient of two integers, and

       their decimal forms do not terminate or repeat. OPPOSITE OF A RATIONAL

       NUMBER

III. Properties of Addition and Multiplication

Property	Addition	Multiplication
CLOSURE		
COMMUTATIVE		
ASSOCIATIVE		
IDENTITY		
INVERSE		
DISTRIBUTIVE		

IV. Model Problems

Ex 1: Consider the numbers $$\left\{2.\bar{3}, \pi, \sqrt{5}, -\frac{11}{2}, 2.7652\right\},$$ Order the numbers from greatest to least and classify each number by the subset of the real number to which it belongs to.	Ex 2: Consider the numbers $$\left\{-0.2, \frac{7}{5}, -5, -\pi, \sqrt{2}, -3.14, 0, 1\right\},$$ Order the numbers from greatest to least and classify each number by the subset of the real number to which it belongs to.
Your Turn: Consider the numbers $$\left\{-1.7, 5, \frac{9}{2}, -\sqrt{7}, -3\right\},$$ Order the numbers from greatest to least and classify each number by the subset of the real number to which it belongs to.	Ex 3: Identify the property that illustrates, $7 + 4 = 4 + 7.$

Ex 4: Find the additive and multiplicative inverse of 12	Ex 5: Write the additive and multiplicative identity property of–9/4
Your Turn: Write the additive and multiplicative identity property of 12/11	Ex 6: Classifying each statement as <u>sometimes</u>, <u>always</u>, or <u>never true</u>. Give examples or properties to support your answers, $a \bullet b = a$, where $b = 3$
Ex 7: Classifying each statement as <u>sometimes</u>, <u>always</u>, or <u>never true</u>. Give examples or properties to support your answers, $(a \div b) \div c = a \div (b \div c)$	Your Turn: Classifying each statement as <u>sometimes</u>, <u>always</u>, or <u>never true</u>. Give examples or properties to support your answers, $\boldsymbol{a - (b + c) = (a - b) + (a - c)}$

Assignment: Page 6, 3-15 odd (3-7 odd also classify the numbers as rational, irrational, integer, whole, and natural), 49-53 odd

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GRAPHING NUMBERS Graph the numbers on a number line.

3. $-\frac{3}{4}, 5, \frac{9}{2}, -2, -1$

4. $-3, \frac{5}{2}, 2, -\frac{9}{4}, 4$

5. $1, \sqrt{3}, -\frac{2}{3}, -\frac{5}{4}, 2$

6. $6, -\sqrt{5}, 2.7, -2, \frac{7}{3}$

7. $-0.4, \frac{3}{2}, 0, \sqrt{10}, -1$

8. $-1.7, 5, \frac{9}{2}, -\sqrt{8}, -3$

ORDERING NUMBERS In Exercises 9 and 10, use the table of elevations below.

State	Alabama	California	Kentucky	Louisiana	Tennessee
Highest elevation	2407 ft	14,494 ft	4145 ft	535 ft	6643 ft
Lowest elevation	0 ft	−282 ft	257 ft	−8 ft	178 ft

9. 🚩 **TAKS REASONING** Which list shows the highest elevations in order from least to greatest?

Ⓐ 2407; 14,494; 4145; 535; 6643

Ⓑ 535; 2407; 4145; 6643; 14,494

Ⓒ 14,494; 2407; 4145; 535; 6643

Ⓓ 14,494; 6643; 4145; 2407; 535

10. 🚩 **TAKS REASONING** Which list shows the lowest elevations in order from greatest to least?

Ⓐ 0, −8, 178, 257, −282

Ⓑ −282, −8, 0, 178, 257

Ⓒ −282, 257, 178, −8, 0

Ⓓ 257, 178, 0, −8, −282

IDENTIFYING PROPERTIES Identify the property that the statement illustrates.

11. $(4 + 9) + 3 = 4 + (9 + 3)$

12. $15 \cdot 1 = 15$

13. $6 \cdot 4 = 4 \cdot 6$

14. $5 + (-5) = 0$

15. $7(2 + 8) = 7(2) + 7(8)$

16. $(6 \cdot 5) \cdot 7 = 6 \cdot (5 \cdot 7)$

REASONING Tell whether the statement is *always*, *sometimes*, or *never* true for real numbers *a*, *b*, and *c*. *Explain* your answer.

49. $(a + b) + c = a + (b + c)$

50. $(a \cdot b) \cdot c = a \cdot (b \cdot c)$

51. $(a - b) - c = a - (b - c)$

52. $(a \div b) \div c = a \div (b \div c)$

53. $a(b - c) = ab - ac$

54. $a(b \div c) = ab \div ac$