Algebra 2 CP
1-2 Properties of Real Numbers

Name _____
Date _____ **A#5**

Goal: 1. To graph and order real numbers 2. To identify properties of real numbers

Subsets of Real Numbers

Natural numbers $1, 2, 3, 4, \ldots$

Natural numbers are _____

Whole numbers $0, 1, 2, 3, 4, \ldots$

Whole numbers are _____

Integers $\ldots -3, -2, -1, 0, 1, 2, 3, 4, \ldots$

The integers are _____

Each negative integer is the [ ], or additive [ ], of a positive integer.

Rational numbers

Rational numbers are _____

Each quotient must have a [ ] denominator.

Some rational numbers can be written as _____

All other rational numbers can be written as _____

Examples $\frac{7}{5}, \frac{-3}{2}, -\frac{4}{5}, 0, 0.3, -1.2, 9$

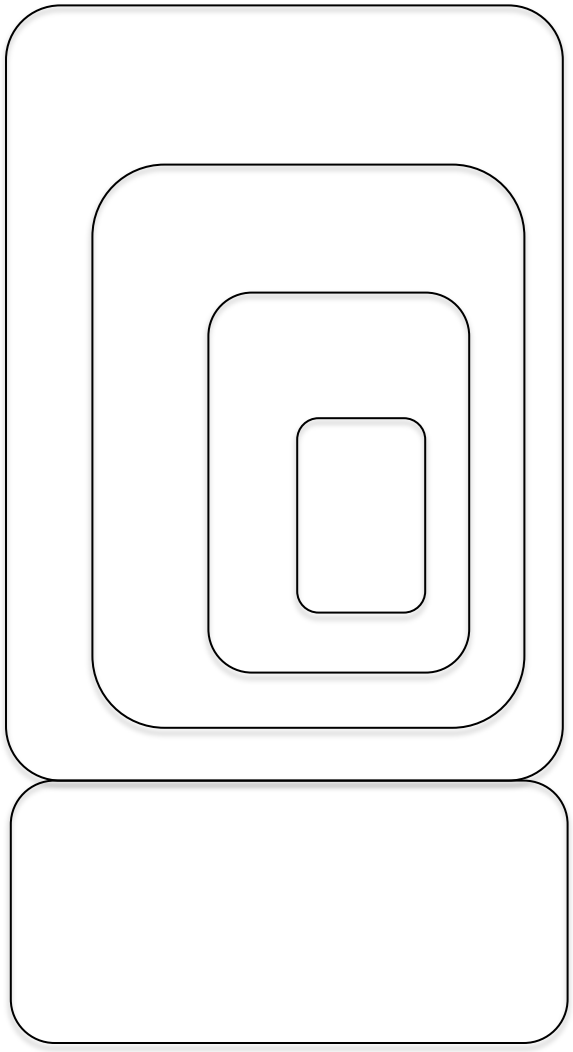
Irrational numbers

Irrational numbers are _____

Their decimal representations neither [ ] nor [ ].

If a positive rational number is not a perfect square such as 25 or $\frac{4}{9}$, then its square root is [ ].

Examples $\sqrt{2}, \sqrt{7}, \sqrt{\frac{2}{3}}, \pi, 1.011011101111011111 \ldots$



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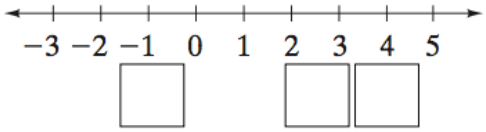
Examples

1 Graphing Numbers on the Number Line Graph the numbers $-\frac{3}{4}$, $\sqrt{7}$, and 3.6 on a number line.

$-\frac{3}{4}$ is between ☐ and 0. Use a calculator to find that $\sqrt{7} \approx$ ☐.



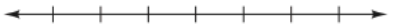
2 Ordering Real Numbers Compare -9 and $-\sqrt{9}$. Use the symbols $<$ and $>$

$\sqrt{9} =$ ☐, so $-\sqrt{9} =$ ☐.

Since $-9 < -3$, it follows that $-9 <$ ☐.

Quick Check

1. Graph the numbers $-\sqrt{2}$, $0.\overline{3}$, and $-2\frac{1}{4}$.



2. Compare $-\sqrt{0.08}$ and $-\sqrt{0.1}$ using the symbols $<$ and $>$.

Properties of Real Numbers

Let a, b, and c represent real numbers.

Property	Addition	Multiplication
	$a + b$ is a real number	ab is a real number
	$a + b = b + a$	$ab = ba$
	$(a + b) + c = a + (b + c)$	$(ab)c = a(bc)$
	$a + 0 = a, \quad 0 + a = a$	$a \cdot 1 = a, \quad 1 \cdot a = a$
	$a + (-a) = 0$	$a \cdot \frac{1}{a} = 1, \quad a \neq 0$
	$a(b + c) = ab + ac$	

Name the property of real numbers illustrated by each equation.

3. $2\left(3+\sqrt{5}\right)=2\cdot 3+2\cdot\sqrt{5}$

4. $16 + (-13) = -13 + 16$

5. $-7\left(\frac{1}{-7}\right)=1$

6. $5\left(0.2\cdot 7\right)=\left(5\cdot 0.2\right)\cdot 7$

Name the property of real numbers illustrated by each equation.

7. $\frac{2}{3} \cdot \frac{3}{2} = 1$

8. $6(2 + x) = 6 \cdot 2 + 6 \cdot x$

9. $2 \cdot 20 = 20 \cdot 2$

10. $8 + (-8) = 0$

11. $2(0.5 \cdot 4) = (2 \cdot 0.5) \cdot 4$

12. $-11 + 5 = 5 + (-11)$

Classify each variable according to the set of numbers that best describes its values.

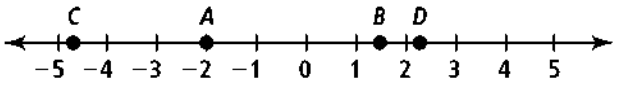
13. the area of the circle A found by using the formula πr^2

14. the number n of equal slices in a pizza; the portion p of the pizza in one slice

15. the air temperature t in Saint Paul, MN, measured to the nearest degree Fahrenheit

16. the last four digits s of a Social Security number

Estimate the numbers graphed at the labeled points.



17. point A

18. point B

19. point C

20. point D