2.1 Operations w/ #s

Obj: 1. Identify & use properties of real #s
2. Evaluate expressions.

Real #s

Number Sets

Natural ("Counting") #s: 1, 2, 3, 4, ...

Whole #s: 0, 1, 2, 3, ...

Integers: ....-3, -2, -1, 0, 1, 2, 3, ...

Rational #s: $\frac{p}{q}$ if p, q are integers

Irrational #s: any # whose decimal part does not terminate or repeat.

π : irrational 3.14159.....

.333..... $\frac{1}{3}$ rational

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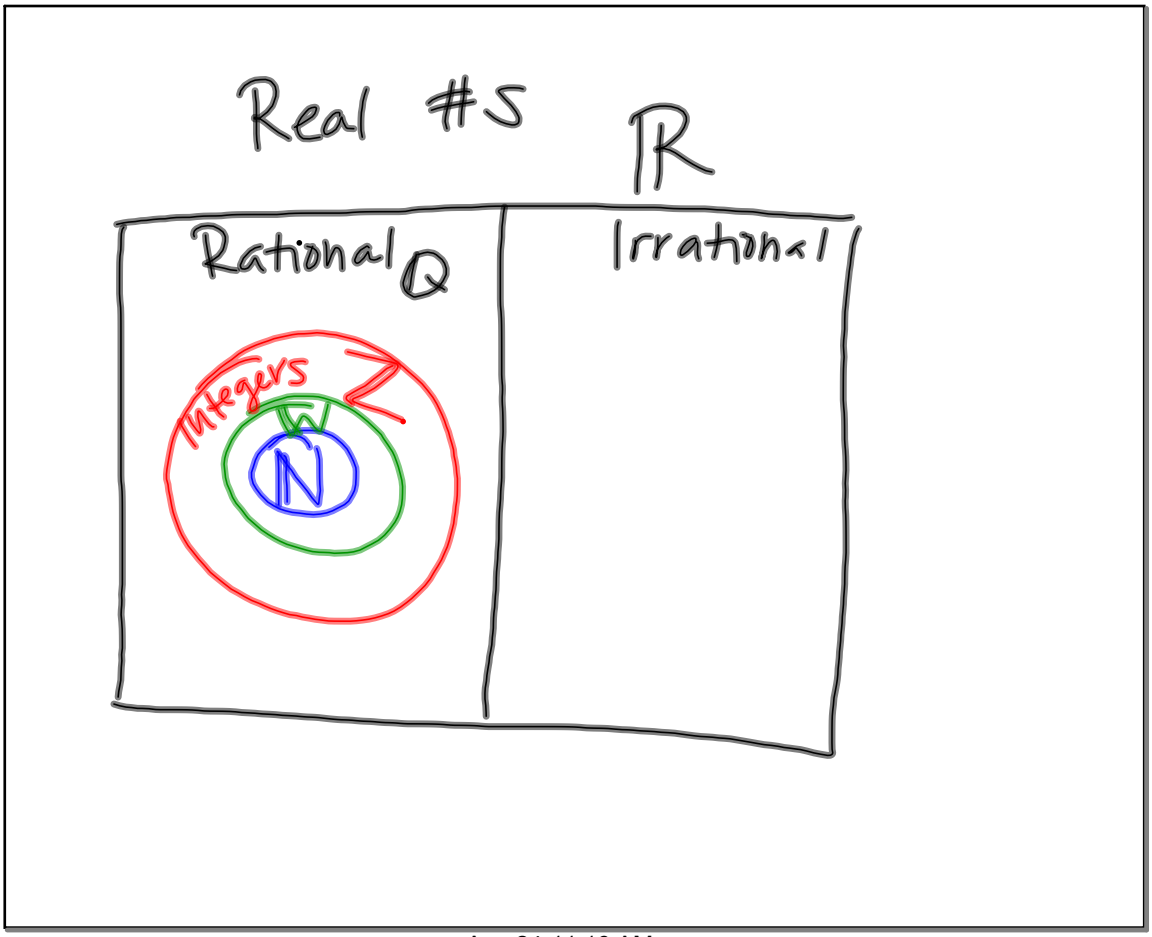

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Classify in as many ways as possible:

a. -2.7
Real, Rational

b. $178{,}000$
Real, Natural
Whole, Integer
Rational

c. $12.020020002\ldots$
Real
Irrational

d. $2.727272\ldots$
Rational, Real

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Properties

	Addition	Mult.
For all real #s	a, b, c	
Closure	$(a+b)$ is a real #	(ab) is a real #
Commutative	$a+b=b+a$	$ab=ba$
Associative	$(a+b)+c=a+(b+c)$	$(ab)c=a(b$
Identity	$a+0=a$	$a\cdot 1=$
Inverse	$\exists$ (there exists) a # such that $a+(-a)=0$	$a\cdot\frac{1}{a}=$
	$2+(-2)=0$	$2\cdot\frac{1}{2}=1$
	$3+(-3)=0$	$3\cdot\frac{1}{3}=1$

Distributive: $a(b+c)=ab+ac$

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Simplify. Justify each step.

$(a+b)(c-d)$

* $ac - ad + bc - bd$ Distrib.

* $ac + bc - ad - bd$ Commutative

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Evaluate

$\frac{2^2(12+8)}{5}$

$\frac{2^2(20)}{5} = \frac{4(20)}{5} = \frac{80}{5} = 16$

$\frac{18-2\cdot5}{15+3(-3)} = \frac{(18-10)}{(15-9)}$

$\frac{8}{6} = \frac{4}{3}$

$\frac{6(11+3^2)}{8}$

$\frac{6(11+9)}{8} = \frac{6(20)}{8} = \frac{120}{8} = 15$

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