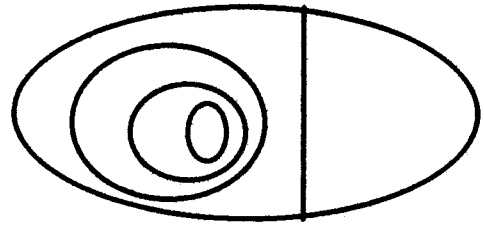


NUMBER SYSTEMS

1. In your own words explain each of the following terms: real R , rational Q , irrational \bar{Q} , integers I , whole W and natural numbers N .

2. Fill in the following Venn diagram.



3. State if each of the following statements is true or false, if it is false explain why.

- a) All rational numbers are real numbers.
- b) All natural numbers are real numbers.
- c) All rational numbers are irrational numbers.
- d) All integers are natural numbers.
- e) All whole numbers are irrational numbers.

4. Complete the table. Make sure to check off all possible answers.

	Natural number N	Whole number W	Integers I	Rational number Q	Irrational number \bar{Q}	Real number R
-3						
$\sqrt{7}$						
$\frac{3}{4}$						
3.171 717 ...						
5.626 226 222 ...						
$\sqrt{36}$						
$-\frac{2}{3}$						
$3\frac{1}{2}$						
π						

Why Do Witches Ride On Brooms?

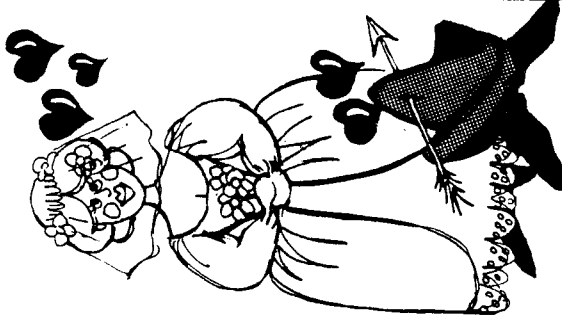
Circle the letter of the phrase which best completes each statement below. Write this letter in each box at the bottom of the page that contains the statement number.

1	A decimal in which the same sequence of digits repeats again and again is called a(n) (S) repeating decimal (R) irrational number
2	Every repeating decimal represents a (n) (E) irrational number (O) rational number
3	An irrational number is a number that is represented by a (D) repeating decimal (Y) nonrepeating decimal
4	Every rational number can be represented either by a repeating decimal or by a (P) nonrepeating decimal (M) terminating decimal
5	A number that can be represented by a fraction is a(n) (L) rational number (T) irrational number
6	An integer is a(n) (D) irrational number (R) rational number
7	Between any two rational numbers there is a(n) (T) rational number (P) integer
8	The union of the set of rational numbers and the set of irrational numbers is called the (N) set of real numbers (G) set of integers
9	Every repeating or nonrepeating decimal represents a (H) real number (K) rational number
10	A real number that is not a rational number is a(n) (A) repeating decimal (E) irrational number
11	A real number that can be represented by a nonrepeating decimal is a(n) (I) rational number (A) irrational number
12	Every point on the number line can be named by a(n) (B) irrational number (V) real number
13	Between any two points on the number line, there is a(n) (I) empty set (U) point
14	Every repeating or nonrepeating decimal numeral determines (C) one point on the number line (F) two points on the number line

12	11	14	13	4	14	5	10	11	8	10	6	1	11	6	10	7	2	9	10	11	12	3
----	----	----	----	---	----	---	----	----	---	----	---	---	----	---	----	---	---	---	----	----	----	---

GET THE MESSAGE

DIRECTIONS:
Decide whether each of these decimals represents a rational number or an irrational number. Circle the letter in the appropriate column next to each decimal.
When you finish, print the circled letters in the row of boxes at the bottom of the page. **FIRST** print those from the column marked "Rational," **THEN** print those from the column marked "Irrational."
A MESSAGE WILL APPEAR!



0.135135135135...	0.6	-2.2422422242222224...	-0.292929292929...	-0.06006000600006...	0.7105386266520861...	3.4076407640764076...	-155.233333333...	0.61661166611666611116...	-0.142857142857142857...	-74.7584630674348297...	6.125	0.786666666666...	-73.00025252525...	40.864301019654885385...	-9.707121221222122221...	200.0096009600960096...	0.112123123412345...	17.70027485281086486350...	-8.0	-0.999919999119991119...	3.14159265358979323846...
M	A	N	I	L	N	D	M	E	A	K	R	I	O	R	N	N	W	H	M	A	K

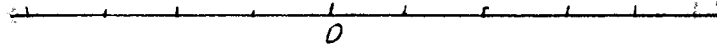
RATIONAL
IRRATIONAL

GRAPHING ON NUMBER LINES

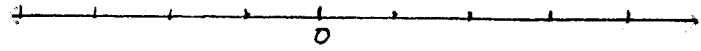
DATE: _____

① GRAPH EACH OF THE FOLLOWING ON THE NUMBER LINE AT RIGHT:

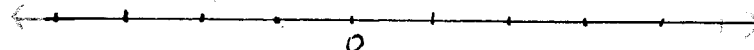
a) $\{-2, -1, 0, 1, 2 \dots\}$



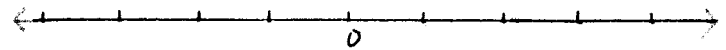
b) $\{0, 1, 2, 3, 4\}$



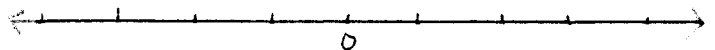
c) $\{\dots, -1, 0, 1, 2\}$



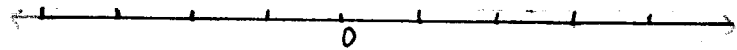
d) $\{3, 4, 5 \dots\}$



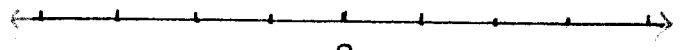
e) $\{x \in \mathbb{N} \mid x \geq 3\}$



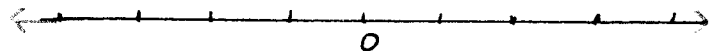
f) $\{x \in \mathbb{W} \mid x \leq 4\}$



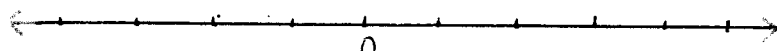
g) $\{x \in \mathbb{I} \mid x < 3\}$



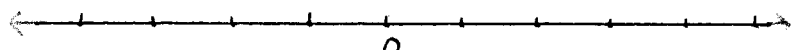
h) $\{x \geq -2, x \in \mathbb{I}\}$



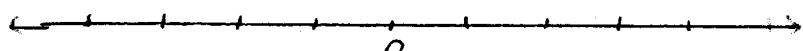
i) $\{x < 5, x \in \mathbb{N}\}$



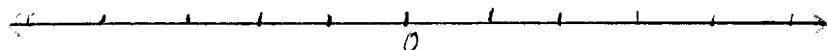
j) $\{x < 5, x \in \mathbb{W}\}$



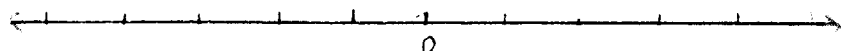
k) $\{x < 5, x \in \mathbb{I}\}$



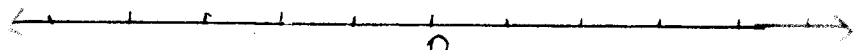
l) $\{x \neq 2, x \in \mathbb{W}\}$



m) $\{x \neq 2, x \in \mathbb{I}\}$



n) $\{x \in \mathbb{I}, x \geq -3\}$



MST 1W0

Number Systems

Answer each question YES or NO. Think about each question carefully.

- 1 Is every integer a real number?
- 2 Is every integer an irrational number?
- 3 Is every real number an irrational number?
- 4 Is every irrational number a real number?
- 5 Is the set of rational numbers a subset of the set of irrational numbers?
- 6 Is the set of rational numbers a subset of the set of natural numbers?
- 7 Is the set of whole numbers a subset of the set of rational numbers?
- 8 Is there a least integer?
- 9 Is there a least positive real number?
- 10 Is there a least non-negative rational number?
- 11 Is there a greatest rational number?
- 12 Does every rational number have a reciprocal that is a rational number?

13 If $\frac{a}{b}$ is any rational number, can $a = 0$?

14 If $\frac{a}{b}$ is any rational number, can $b = 0$?

15 Can the square root of a natural number be an irrational number?

16 Is the square root of every prime number an irrational number?

17 Can the square root of a number be a whole number?

18 Is the square root of every composite number an integer?

19 Can the length of any distance in the physical world be an irrational number?

20 Is the set of irrational numbers infinite?

MST 1W0

Number Systems

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