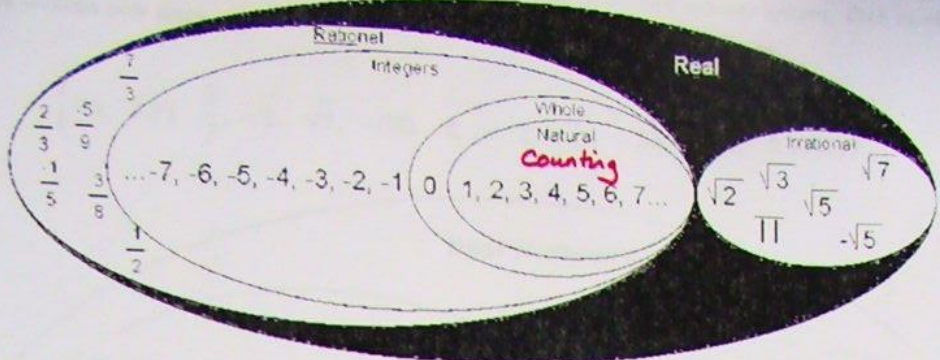


Notes

Real Number System



Definition:

A rational number is a number that can be expressed as a fraction (ratio) in the form $\frac{p}{q}$ where p and q are integers and q is not zero.

Examples: $\frac{1}{2}$, 8, $\frac{5}{3}$, $\sqrt{4}$, $7\frac{1}{9}$, -12, $\frac{\sqrt{64}}{\sqrt{25}}$, 6.25, $0.3\overline{18}$

terminating
repeating

A rational number can be expressed as a ratio (fraction).

When a rational number fraction is divided to form a decimal value, it becomes a **terminating** or **repeating decimal**.

$\frac{3}{4}$ can be represented as $4 \overline{) 3.00}$ which is a terminating decimal.

$\frac{2}{3}$ can be represented as $3 \overline{) 2.0}$ which is a repeating decimal.

Definition:

An irrational number is a number that is NOT rational. It cannot be expressed as a fraction with integer values in the numerator and denominator.

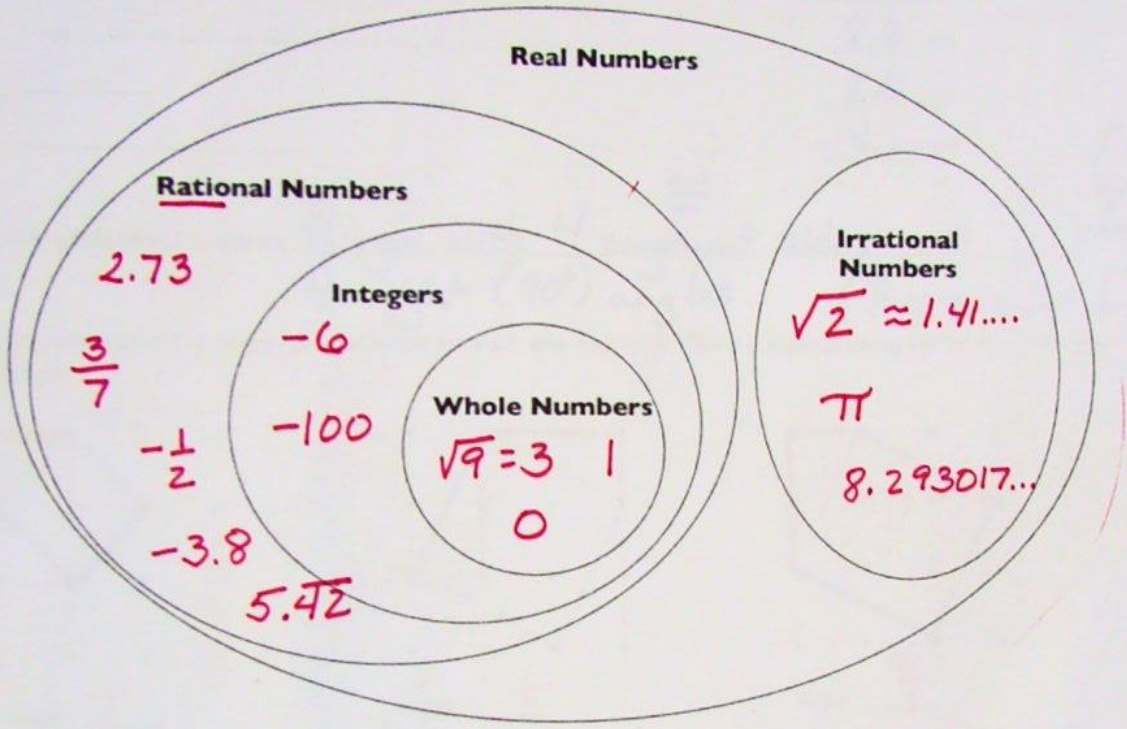
Examples: $\frac{\sqrt{3}}{2}$, π , $-\sqrt{27}$, $0.131331333\dots$, $\frac{\sqrt{13}}{\sqrt{2}}$, 4π , $3 + \sqrt{5}$

When an irrational number is expressed in decimal form, it goes on forever without repeating.

<p>Regarding π:</p> <p>$\pi \neq \frac{22}{7}$</p> <p>$\pi \neq 3.14$</p>	<p>While it is popular to use 3.14 or $\frac{22}{7}$ to represent "π", these values are only estimates or approximations. Notice the differences in the decimal representations on the calculator screen at the right.</p>	<table border="1"> <tr> <td>π</td> <td>3.141592654</td> </tr> <tr> <td>$\frac{22}{7}$</td> <td>3.142857143</td> </tr> </table>	π	3.141592654	$\frac{22}{7}$	3.142857143
π	3.141592654					
$\frac{22}{7}$	3.142857143					
<p>$\pi = 3.14159265358979323846264338327950288419716939937510582097\dots$</p>						

Write each number in the correct location on the Venn Diagram of the real number system. Each number should be written only once.

- $\{-6, 2.73, \frac{3}{7}, \sqrt{2}, \sqrt{9}, -100, 0, \pi, i, -\frac{1}{2}, -3.8, 5.\overline{42}, 8.293017\dots\}$



Put a check mark for each set that the number is a part of:

	Whole Numbers	Integers	Rational Numbers	Irrational Numbers	Real Numbers
-7		✓	✓		✓
$\frac{3}{4}$			✓		✓
$\sqrt{2}$				✓	✓
5	✓	✓	✓		✓
0.398			✓		✓
$0.\overline{398}$			✓		✓

Creating Squares

Notes:

Measure each of the following segments to the nearest tenth of a cm.

Segment

Measure

6.0 cm

8.8 cm

2.0 cm

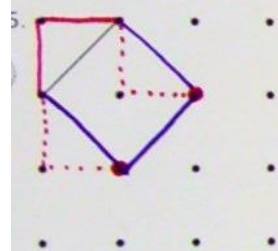
4.2 cm

State the attributes of a square:

Polygon with 4 congruent sides and 4 right (90°) angles. (Perpendicular \perp)

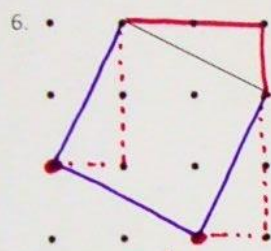


State the slope and the perpendicular slope for each line segment. Draw a square using the segment as one side length.



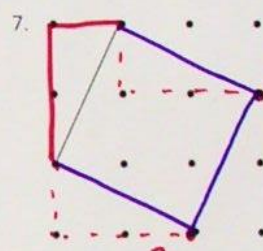
Slope: $\frac{1}{1}$

\perp Slope: $-\frac{1}{1}$



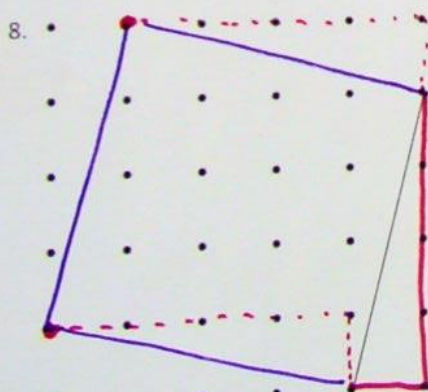
Slope: $-\frac{1}{2}$

\perp Slope: $\frac{2}{1} = \frac{-2}{-1}$



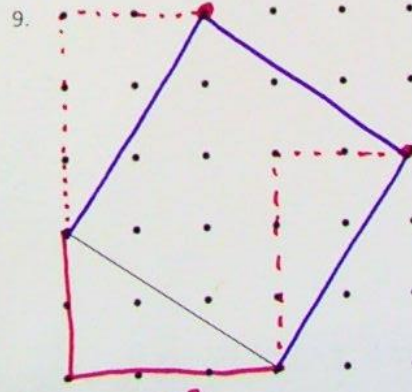
Slope: $\frac{2}{1}$

\perp Slope: $-\frac{1}{2}$



Slope: $\frac{4}{1}$

\perp Slope: $-\frac{1}{4} = \frac{1}{-4}$



Slope: $-\frac{2}{3}$

\perp Slope: $\frac{3}{2}$