# M10C Number Systems and Ordering

1. Number Systems Intro

2. Place numbers into Number Systems

3. Order sets of numbers

Number Systems Intro

All the numbers on a number line belong to the set of Real Numbers.

These Real Numbers can also be broken up into more specific sets...
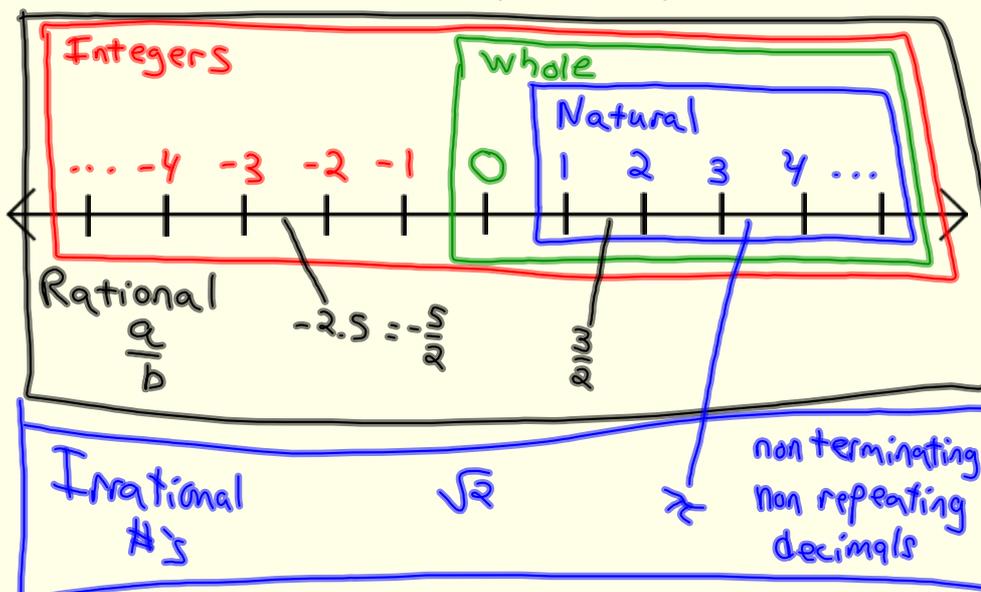
Activity: Make your own graphic organizer to show the relationship between the number systems. (Minibook)

Place Numbers into the Number Systems

Use your number system model to identify **all** the number systems that the following numbers belong to.

a) -6 → Integer, Rational, Real

b) 0 → Whole, I, Rational, Real

c) $\sqrt{5}$ → Irrational, Real

d) $\dfrac{-2}{3}$

e) $\sqrt[3]{125}$

f) $2.718281...$

g) -4.513

Ordering Numbers

Recall: Use benchmarks to estimate square roots and cube roots.

$\sqrt{85} \approx$ 9.3

$\sqrt[3]{100} \approx$ 4.5

$\sqrt{81}$ ———— $\sqrt{100}$
9   9.3   10

$\sqrt[3]{64}$ ———— $\sqrt[3]{125}$
4   4.5   5
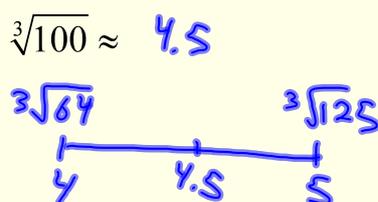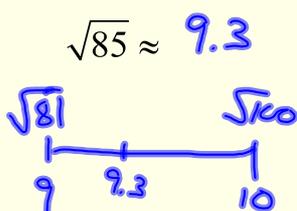
Practice: Arrange the following numbers on a number line.

a) $\sqrt[3]{13}, -0.5, \sqrt{18}, 9^{\frac{1}{2}}, \sqrt[4]{27}, (-5)^{\frac{1}{3}}$ (Board Work)

b) $\sqrt{2}, 2^{\frac{1}{3}}, \sqrt[3]{6}, \sqrt{11}, 30^{\frac{1}{4}}$

Ordering Numbers

Recall: Changing between mixed radicals and entire radicals.

$$5\sqrt{4} = \sqrt{25} \cdot \sqrt{4} \qquad 4\sqrt[3]{2} = \sqrt[3]{64} \cdot \sqrt[3]{2}$$

$$= \sqrt{100} \qquad\qquad = \sqrt[3]{128}$$

$$= 10$$

Practice: Arrange the following numbers on a number line.

a) $2\sqrt{18}$ $\sqrt{8}$ $3\sqrt{2}$ $\sqrt{32}$ (Board Work)

$\sqrt{4} \cdot \sqrt{18}$ $\sqrt{9} \cdot \sqrt{2}$

$\sqrt{72}$ $= \sqrt{18}$

b) $3\sqrt[3]{2}$ $\sqrt[3]{81}$ $5\sqrt[3]{2}$ $2\sqrt[3]{3}$

$\sqrt[3]{54}$ $\sqrt[3]{250}$ $\sqrt[3]{24}$