Name: _____

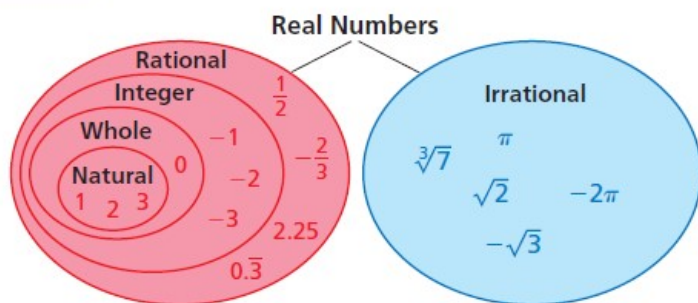An _____ _____ is a number that cannot be written as $\dfrac{a}{b}$ where $a$ and $b$ are integers, and $b \neq 0$.

Irrational Numbers can take 3 forms:

_____     _____          _____



**Key Idea**

**Real Numbers**
Rational numbers and irrational numbers together form the set of **real numbers**.

## Classifying Real Numbers

Ex:)  Classify each real number.

| | Number | Subset(s) | Reasoning |
|---|---|---|---|
| a. | $\sqrt{12}$ | | |
| b. | $-0.\overline{25}$ | | |
| c. | $-\sqrt{9}$ | | |
| d. | $\sqrt[3]{15}$ | | |
| e. | $\pi$ | | |

Notes:

When classifying a real number, list all the subsets in which the number belongs.

OYO:)  Classify each real number.                    Notes:

| | Number | Subset(s) | Reasoning |
|---|---|---|---|
| a. | $0.121221222\ldots$ | | |
| b. | $-\sqrt{196}$ | | |
| c. | $\sqrt[3]{2}$ | | |
| d. | $\sqrt{0}$ | | |

## Approximating an Irrational Number

Ex:)  Approximate $-\sqrt{24}$ to the nearest (a) integer and (b) nearest tenth.          Notes:

a.

b.

OYO:)  Approximate $\sqrt{71}$ to the nearest (a) integer and (b) nearest tenth.    Notes:

a.

b.

## Comparing Irrational Numbers

Ex:)  Which is greater, $\sqrt{35}$ or $\sqrt[3]{80}$ ?                      Notes:

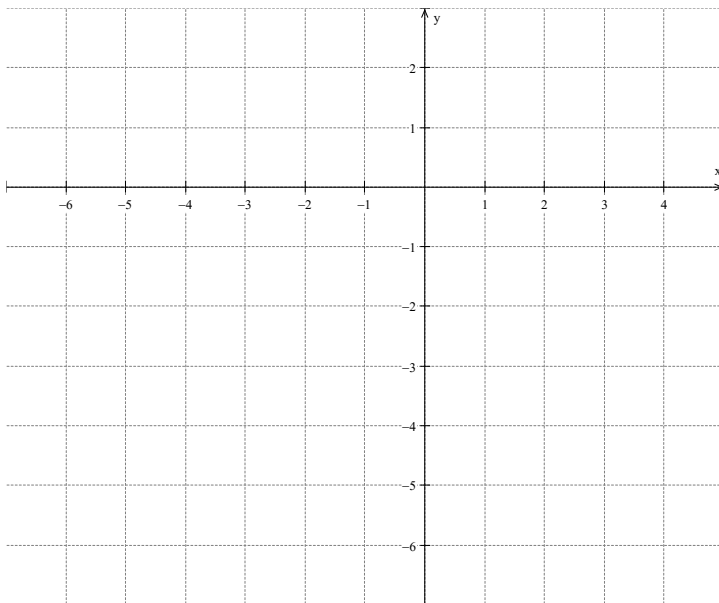You can use the same procedure to approximate cube roots as you used for square roots.

OYO:)  Which is greater, $-\sqrt{2}$ or $-\sqrt[3]{10}$ ?                    Notes:
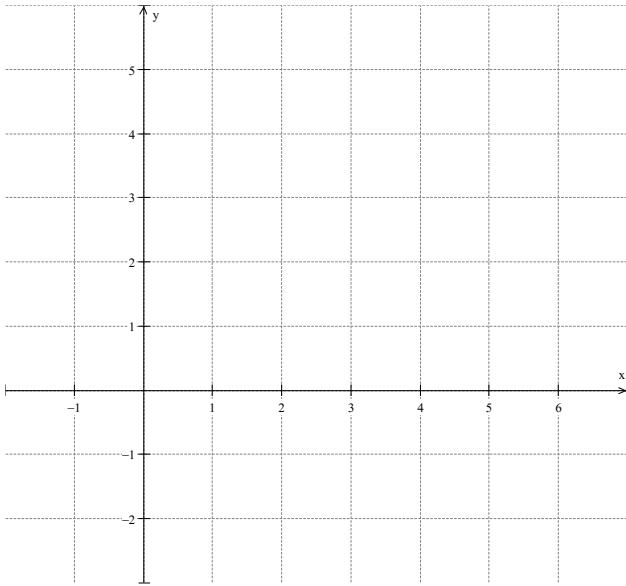
## Using the Pythagorean Theorem

Ex:)     Approximate the distance between (-4, -3) and (3, -5) to the                    Notes:
nearest tenth.

OYO:)  Approximate the distance between (1, -1) and (5, 4) to the nearest tenth.

## Modeling Real Life

Ex:)  The equation $d^2 = 1.37h$ represents the relationship between The distance $d$ (in nautical miles) you can see with a periscope and the height $h$ (in feet) of the periscope above the water.  About how far can you see when the periscope is 3 feet above the water?

OYO:) Which plane is closer to the base of the Airport Tower?             Notes:
Justify your answer.



Airport
Tower

Altitude: Plane A
6 km

Altitude: Plane B
3 km

5 km               2 km

*Not drawn to scale*