COMPARING IRRATIONAL NUMBERS

If we want to compare irrational numbers, it's easiest to use approximation.

AND STILL ACCURATE ENOUGH!

> There is a special irrational number called π. It is the Greek letter *pi* and is read like "pie." The value of pi is 3.14159265... but is commonly rounded to 3.14.

EXAMPLE: Which is larger? 6 or 2π?

Because π is approximately 3.14, it means that 2π is approximately $2 \times 3.14 = 6.28$.
$2\pi > 6$.

The square root of a perfect square is easy to find, like $\sqrt{9} = 3$. But we can also find the approximate values of numbers like $\sqrt{2}$ or $\sqrt{10}$ by "working backward."

EXAMPLE: Which is larger, $\sqrt{5}$ or 2.1?

First, we need to find out what is the approximate value of $\sqrt{5}$ to the tenth decimal place.

We know that $1^2 = 1$, $2^2 = 4$, $3^2 = 9$
or $\sqrt{1} = 1$, $\sqrt{4} = 2$, $\sqrt{9} = 3$.

≈ MEANS APPROXIMATELY EQUAL

So, $\sqrt{5}$ must be between 2 and 3 ... therefore, $\sqrt{5} \approx 2$.

The question asks us to compare the approximate value with a number that has a value in the tenth place, so we can then try:

$2.0^2 = 4$, $2.1^2 = 4.41$, $2.2^2 = 4.84$, $2.3^2 = 5.29$.

So, $\sqrt{5}$ must be between 2.2 and 2.3, but it's closer to 2.2 ... therefore, $\sqrt{5} \approx 2.2$.

Therefore $\sqrt{5}$ is larger than 2.1.

If you needed to find out what is the approximate value of $\sqrt{5}$ to the hundredth decimal place, you would just repeat the process of "working backward," and try:

$2.21^2 = 4.8841$, $2.22^2 = 4.9284$ ... and so on until you found the closest approximation.

1. Calculate 2π. Round your answer to the hundredth decimal place.

2. Calculate 5π. Round your answer to the hundredth decimal place.

3. Calculate -3π. Round your answer to the hundredth decimal place.

4. Calculate $\frac{1}{2}\pi$. Round your answer to the hundredth decimal place.

5. What is the approximate value of $\sqrt{3}$ to the tenth decimal place?

6. What is the approximate value of $\sqrt{6}$ to the tenth decimal place?

7. What is the approximate value of $\sqrt{2}$ to the hundredth decimal place?

8. What is the approximate value of $\sqrt{5}$ to the hundredth decimal place?

9. Which is the largest number: $\sqrt{10}$, π, or 3?

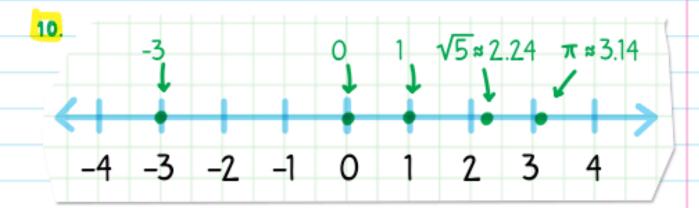10. Draw a number line and place the following numbers in the correct location: $-3, 0, 1, \pi, \sqrt{5}$

1. 6.28

2. 1.57

3. -9.42

4. 1.57

5. $\sqrt{3} \approx 1.7$

6. $\sqrt{6} \approx 2.4$

7. $\sqrt{2} \approx 1.42$

8. $\sqrt{5} \approx 2.24$

9. The largest number is $\sqrt{10}$.

10.