Monday 10/7/19
1. Grab CALC & Notes
2. Warm-up
3. INB
4. Domain/Range Notes
5. HW/Practice
### Topic: Domain and Range

#### What am I learning today?

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#### Warm Up

**Characteristics**

Describe the following characteristics.

1) \( f(x) = -2x^2 + 4x^3 - 2x + 1 \)

- **Degree:** \( \text{Odd} \)
- **Leading Coefficient (LC):** \( -1 \)
- **End Behavior:** \( f(x) \to -\infty \) as \( x \to -\infty \), \( f(x) \to -\infty \) as \( x \to \infty \)
- **X-Intercepts:** \( (1.0), (1.5), (-1.5) \)
- **Y-Intercept:** \( (0, 1) \)

\[ f(x) = 4x^3 - 2x^2 - 2x + 1 \]

\[ 0 = (4x^3 - 2x^2 - 2x + 1) \]

\[ 2x^2(2x - 1) - 1(2x - 1) \]

\[ 0 = (2x - 1)(2x - 1) \]

\[ x = \frac{1}{2} \]

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#### Notes

**Domain and Range**

**Domain** is the set of all \( x \) values. The domain of these polynomials will always be all real numbers. We will write the domain as an interval, \( (-\infty, \infty) \).

**Range** is the set of all \( y \) values. The range of these polynomials is determined by the direction. Odd: The range of an odd function will always be all real numbers. We will write the range as an interval, \( (-\infty, \infty) \).

Even: The range of an even function will stop or start at a number. We will write the range as an interval, \( (-\infty, #) \) or \( (#, \infty) \).

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#### Examples

Find the Domain and Range.

1) Domain: \( (-\infty, 0) \)

   Range: \( (-\infty, \infty) \)

2) Domain: \( (-\infty, \infty) \)

   Range: \( (-\infty, 4) \)
**Topic:** Domain and Range

**Examples**
Find the Domain and Range

3) Domain: $(-\infty, \infty)$
Range: $[0, \infty)$

4) Domain: $(-\infty, \infty)$
Range: $(-\infty, \infty)$

**Summary**
Summarize the lesson in your own words

- **Domain:** $(-\infty, \infty)$
- **Range:** $[0, \infty)$
- **Y-intercept:** $(0, 0)$
- **x-intercepts:** $(-1, 0), (0, 0), (2, 0)$
- **Local Behavior:**
  - **Max:** $(0.549, 0.631)$
  - **Min:** $(1.215, -2.113)$
- **End Behavior:** $\frac{a}{x^2}$
- **Increasing:** $(-\infty, -0.549), (1.215, \infty)$
- **Decreasing:** $(-0.549, 1.215)$