10.3 - Standard Exponential Form

*Questions so far...

*Reviewing Characteristics of Exponential Functions

*Clear Definition of an Exponential Function

*Examples of Standard Form

*Assignment Time and Reading Time

Lingering Questions
First Look at Exponential Functions

<table>
<thead>
<tr>
<th>Monomial Function</th>
<th>Exponential Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y = x^b )</td>
<td>( y = b^x )</td>
</tr>
<tr>
<td>( f(x) = x^b )</td>
<td>( f(x) = b^x )</td>
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</tbody>
</table>

Input (x) --> base  
Input (x) --> power

Power is constant  
Base is constant

Behavior

- Monomial functions are dependent upon the power used
- Exponential functions all have similar behavior

Case: When \( b = 2 \)...

- Referred to as a quadratic function
- Referred to as the "doubling function"

Exponential Type

A function of Exponential Type has the form...

\[
f(x) = A_0 b^x
\]

- Where \( A_0 \) and \( b \) are constants such that \( A_0 \neq 0 \), \( b > 0 \) and \( b \neq 1 \)

\( A_0 \) indicates the "initial value" and \( b \) is still "base"

This form we often refer to as "standard exponential form"
Put each equation into standard exponential form
"initial value, single base, exponent of just 'x'''

\[ y = 5^{4x} \quad y = 2(10)^{x^2} \quad y = 7^{-x/3} \]

Assignment (Due "Thursday, January 8")
1) Read Chapter 10 pg. 134-137

2) Chapter 10 Problems Packet
   a) 10.1 / 10.5
   b) 10.2 / 10.3

*) Becoming more critical about neat, complete, and organized
\[ y = \frac{5}{0.345^{2x}} \]

\[ y = \frac{5}{(0.345)^{2x}(0.345)^{-x}} \]

\[ y = \frac{5}{(0.345)^{-x}} \]

\[ y = 5(0.345)^{x}(0.345)^{-2x} \]

\[ y = 5(0.345)^{x}(0.345^{-2})^x \]

\[ y = 5(0.345)^{x}\left(\frac{1}{0.345^x}\right)^x \]