GRAPHING EXPONENTIAL FUNCTIONS:

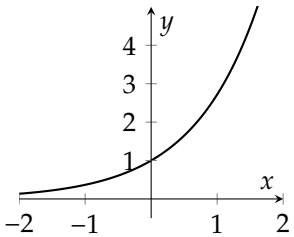
A good knowledge of the exponential graph is necessary for further graphing and other applications.

$y = a^x$

The x-axis is an asymptote.

As $x \to +\infty$, $y \to +\infty$

As $x \to -\infty$, $y \to 0^+$



Domain: $x \in \mathbb{R}$

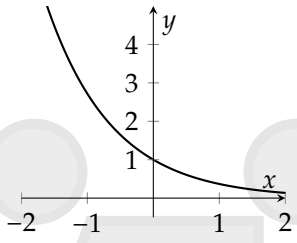
Range: $y < 0$

$y = a^{-x}$

The x-axis is an asymptote.

As $x \to +\infty, y \to 0^+$

As $x \to -\infty, y \to +\infty$



Domain: $x \in \mathbb{R}$

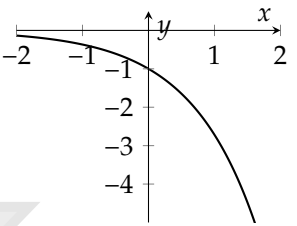
Range: $y > 0$

$y = -a^x$

The x-axis is an asymptote.

As $x \to +\infty$, $y \to -\infty$

As $x \to -\infty$, $y \to 0^-$



Domain: $x \in \mathbb{R}$

Range: $y < 0$

For all graphs, we must label:

- x/y axes
- Origin
- Vertical and/or horizontal asymptotes
- Equation of the graph
- x/y intercepts
- Anchor point (point that is not an intercept)

8.3 WORKED EXAMPLE

Sketch $y = -2^x$.

8.4 WORKED EXAMPLE

Sketch the below graph, with an anchor point.

$$y = \left(\frac{1}{6}\right)^x$$