

Exponential GROWTH Parent Function

Parent Function: $f(x) = b^x, b > 1$

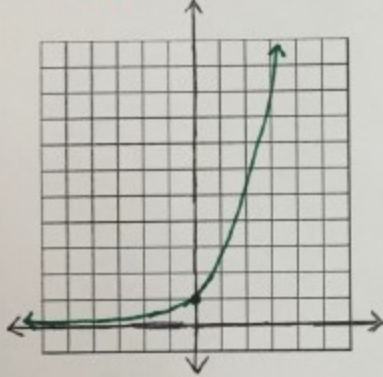
Type of Graph: continuous & increasing

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

Range: $(0, \infty)$

Asymptote: x-axis, $y=0$

Intercept: $(0, 1)$



Exponential DECAY Parent Function

Parent Function: $f(x) = b^x, 0 < b < 1$

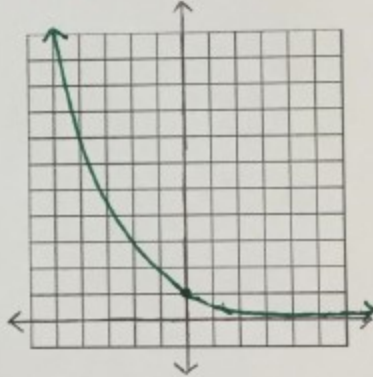
Type of Graph: continuous & decreasing

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

Range: $(0, \infty)$

Asymptote: x-axis, $y=0$

Intercept: $(0, 1)$



Transformations of Exponential Functions

$$f(x) = ab^{x-h} + k$$

a – Orientation and Shape

- * If $a < 0$, reflection over x-axis
- * If $|a| > 1$, vertical stretch
- * If $0 < |a| < 1$, vertical shrink

h – Horizontal Translation

- * h units right if h is positive
- * $|h|$ units left if h is negative

k – Vertical Translation

- * k units up if k is positive
- * $|k|$ units down if k is negative