

Algebra I - Unit 8: Comparing Linear, Quadratic, & Exponential Functions
 Function Comparison Graphic Organizer



| Increase/Decrease | End Behavior | Asymptotes | y-intercept | X-intercept | Domain/Range |
|---|---|---|--|--|---|
| <p>Always increasing</p> <p>Always decreasing</p> | <p>Positive slope? $x \rightarrow -\infty, y \rightarrow -\infty$ $x \rightarrow \infty, y \rightarrow \infty$</p> <p>Negative slope? $x \rightarrow -\infty, y \rightarrow \infty$ $x \rightarrow \infty, y \rightarrow -\infty$</p> | <p>Specials</p> <p>Nothing really</p> | <p>plug in 0 for \boxed{x}</p> <p>AND solve</p> | <p>plug in 0 for $\boxed{f(x)}$ y</p> <p>AND solve!</p> | <p>Linear Functions Ex. $f(x) = 3x + 3$</p> <p>Domain: ALL REAL NUMBERS $(-\infty, \infty)$ TR $-\infty < x < \infty$</p> <p>RANGE: Same!</p> |
| <p>decrease then increase $(-\infty, h)$ (h, ∞)</p> <p>increase then decrease $(-\infty, h)$ (h, ∞)</p> | <p>Positive a? $x \rightarrow -\infty, y \rightarrow \infty$ $x \rightarrow \infty, y \rightarrow \infty$</p> <p>Negative a? $x \rightarrow -\infty, y \rightarrow -\infty$ $x \rightarrow \infty, y \rightarrow -\infty$</p> | <p>Vertex! FIND with h/k in calculator</p> | | | <p>Quadratic Functions Ex. $f(x) = 3x^2 + 3$</p> <p>RANGE: IF a is positive $y > c$ (c, ∞) a is negative $y < c$ $(-\infty, c)$</p> <p>constant (c, c)</p> <p>Same</p> |
| <p>Always increase $(-\infty, \infty)$</p> <p>Always decrease $(-\infty, \infty)$</p> | | <p>Growth/Decay $(b)^x$</p> <p>Asymptote $y = k$ k is constant</p> | | | <p>Exponential Functions Ex. $f(x) = 3^x + 3$</p> <p>Same</p> |

Algebra I - Unit 8: Comparing Linear, Quadratic, & Exponential Functions
 Function Comparison Graphic Organizer



| Linear Function | Quadratic Function | Exponential Function |
|--|---|--|
| Ex. $f(x) = 3x + 3$ | Ex. $f(x) = 3x^2 + 3$ | Ex. $f(x) = 3^x + 3$ |
| Domain $(-\infty, \infty)$ | \mathbb{R} | $-\infty < x < \infty$ |
| Range All real numbers | $(3, \infty)$ | $y > 3$ |
| X-intercept $(-1, 0)$ | none | none |
| Y-intercept $(0, 3)$ | $(0, 3)$ | $(0, 4)$ |
| Asymptotes none | none | $y = 4$ |
| Vertex none | $(0, 3)$ | none |
| End Behavior $x \rightarrow -\infty \quad y \rightarrow -\infty$ $x \rightarrow \infty \quad y \rightarrow \infty$ | $x \rightarrow -\infty \quad y \rightarrow \infty$ $x \rightarrow \infty \quad y \rightarrow \infty$ | $x \rightarrow -\infty \quad y \rightarrow 4$ $x \rightarrow \infty \quad y \rightarrow \infty$ |
| Increase/Decrease increasing $(-\infty, \infty)$ | decreasing $(-\infty, 0)$ increasing $(0, \infty)$ | increasing $(-\infty, \infty)$ |

