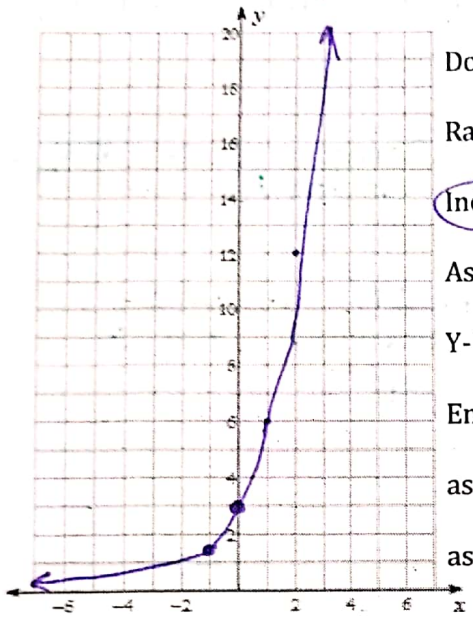
Key
Malinda

Unit 2 Practice: Key Features of Exponential Graphs

Graph each exponential equation then identify the key features of the graph.

1) $y = 3 \cdot 2^x$



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

Range: $(0, \infty)$

Increase or Decrease

Asymptote @ $y = 0$

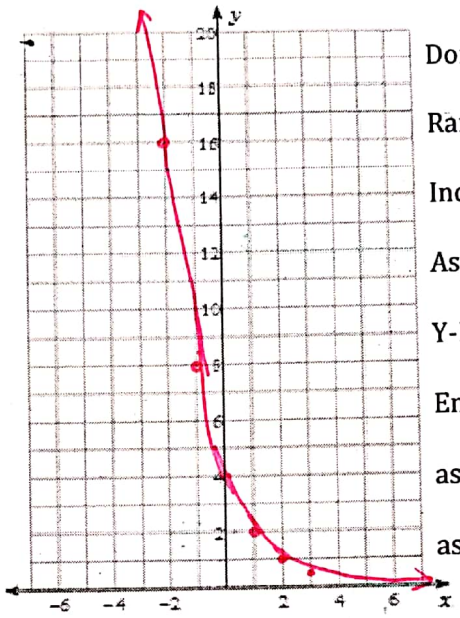
Y-Intercept @ $(0, 3)$

End behavior

as $x \to \infty, y \to$ ∞

as $x \to -\infty, y \to$ 0

2) $y = 4 \cdot \left(\frac{1}{2}\right)^x$



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

Range: $(0, \infty)$

Increase or Decrease

Asymptote @ $y = 0$

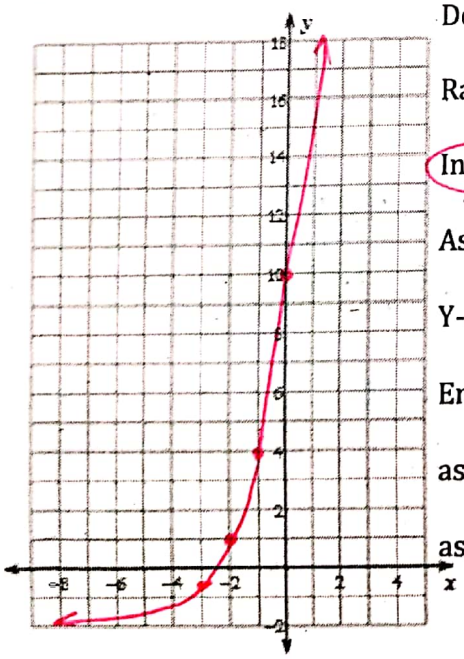
Y-Intercept @ $(0, 4)$

End behavior

as $x \to \infty, y \to$ 0

as $x \to -\infty, y \to$ ∞

3) $y = 3 \cdot 2^{x+2} - 2$



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

Range: $(2, \infty)$

Increase or Decrease

Asymptote @ $y = 2$

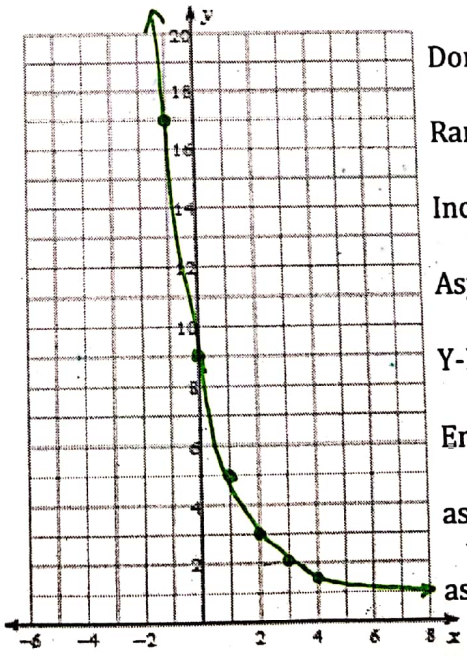
Y-Intercept @ $(0, 10)$

End behavior

as $x \to \infty, y \to$ ∞

as $x \to -\infty, y \to$ 2

4) $y = 4 \cdot \left(\frac{1}{2}\right)^{x-1} + 1$



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

Range: $(1, \infty)$

Increase or Decrease

Asymptote @ $y = 1$

Y-Intercept @ $(0, 9)$

End behavior

as $x \to \infty, y \to$ 1

as $x \to -\infty, y \to$ ∞

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Identify the transformations that occurred to each equation below based on either the parent function $y = 2^x$

1. $y = 2^{x+4}$

left 4

2. $y = 2^x - 3$

down 3

3. $y = 5(2)^x + 6$

Vertical Stretch by 5
up 6

4. $y = 2^{(5x)} + 7$

Horizontal Compression by 5
up 7

5. $y = \frac{1}{3} \cdot 2^{(x-3)} - 5$

Vertical Compression by $\frac{1}{3}$
right 3 down 5

6. $y = -3 \cdot 2^{(x+4)} + 7$

reflection over x-axis
vertical stretch by 3
left 4 up 7

For each exponential equation below, identify the vertical asymptote, domain, and range.

7. $y = 3(2)^{x+4} - 7$

Horizontal asymptote at y = -7

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

Range: $(-7, \infty)$

as $x \to \infty, y \to$ ∞ as $x \to -\infty, y \to$ -7

8. $y = 2^{x-1} + 9$

Horizontal asymptote at y = 9

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

Range: $(9, \infty)$

as $x \to \infty, y \to$ ∞ as $x \to -\infty, y \to$ 9

9. $y = 6^x - 3$

Horizontal asymptote at y = -3

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

Range: $(-3, \infty)$

as $x \to \infty, y \to$ ∞ as $x \to -\infty, y \to$ -3

10. $y = 2\left(\frac{1}{2}\right)^{x-4} + 5$

Horizontal asymptote at y = 5

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

Range: $(5, \infty)$

as $x \to \infty, y \to$ 5 as $x \to -\infty, y \to$ ∞

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