

④ $4^{2x+3} = (\sqrt{4})^{x+4}$ $x = -\frac{2}{3}$

$(2^2)^{2x+3} = 2^{x+4}$ $4^{2x+3} = (4^{\frac{1}{2}})^{x+4}$

$2(2x+3) = x+4$ $2x+3 = \frac{1}{2}(x+4)$

Solving Exponential Equations **GET *LIKE BASES! ***

SOLVE.

① $625^{3p-1} \cdot 25^{-2p} = 5^2$

$(5^4)^{3p-1} \cdot (5^2)^{-2p} = 5^2$

MULT. MULT.

$5^{12p-4} \cdot 5^{-4p} = 5^2$

ADD EXP.

$5^{8p-4} = 5^2$

$8p-4 = 2$

$8p = 6$

$p = \frac{3}{4}$

MUST GET ONE BASE THEN DROP!

$$\textcircled{2} \quad b^{2n+3} \cdot b^{2n} = 1$$

$$b^{2n+3} \cdot b^{2n} = b^0$$

ADD

$$b^{4n+3} = b^0$$

$$4n+3 = 0$$

$$4n = -3$$

$$n = \frac{-3}{4}$$

$\textcircled{3}$

$$100 \cdot 10^{-3b} = 10^{3b}$$

$$b = \frac{1}{3}$$

$$10^2 \cdot 10^{-3b} = 10^{3b}$$

$$10^{2-3b} = 10^{3b}$$

$$\begin{array}{r} 2-3b \\ +3b \end{array} = \begin{array}{r} 3b \\ +3b \end{array}$$

$$\frac{2}{6} = \frac{6b}{6}$$

$$b = \frac{1}{3}$$

$$b = \frac{-2}{11}$$

$\textcircled{4}$

$$\frac{b^4}{16^{b+1}} = 1$$

$$\frac{(4^3)^{-3b}}{(4^2)^{b+1}} = 4^0$$

$$\frac{4^{-9b}}{4^{2b+2}} = 4^0$$

$$4^{-11b-2} = 4^0$$

$$-11b-2 = 0$$

$$-11b = 2$$

$$b = \frac{-2}{11}$$

Honors Math 3 - Exponential Graphing

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Equation	Sketch	Equation	Sketch
<p>1) $y = 2^x$</p> <p>D: $\{x x \in \mathbb{R}\}$</p> <p>R: $\{y y > 0\}$</p> <p>Asymptote: $y = 0$</p> <p>End Behavior: $x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow 0$</p>	<p>Parent: $y = 2^x$ growth</p> <p>Shift from parent: none</p>	<p>4) $y = \frac{1}{2}^x = (2^{-1})^x$ reflect over y</p> <p>D: $\{x x \in \mathbb{R}\}$</p> <p>R: $\{y y > 0\}$</p> <p>Asymptote: $y = 0$</p> <p>End Behavior: $x \rightarrow \infty, y \rightarrow 0$ $x \rightarrow -\infty, y \rightarrow \infty$</p>	<p>Parent: $y = \frac{1}{2}^x$ DECAY</p> <p>Shift from parent: none</p>
<p>2) $y = 2^x - 3$</p> <p>D: $\{x x \in \mathbb{R}\}$</p> <p>R: $\{y y > -3\}$</p> <p>Asymptote: $y = -3$</p> <p>End Behavior: $x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow -3$</p>	<p>Parent: $y = 2^x$</p> <p>Shift from parent: down 3</p>	<p>5) $y = \frac{1}{2}^{x-5}$</p> <p>D: $\{x x \in \mathbb{R}\}$</p> <p>R: $\{y y > 0\}$</p> <p>Asymptote: $y = 0$</p> <p>End Behavior: $x \rightarrow \infty, y \rightarrow 0$ $x \rightarrow -\infty, y \rightarrow \infty$</p>	<p>Parent: $y = \frac{1}{2}^x$</p> <p>Shift from parent: right 5</p>
<p>3) $y = 2^{x+1} - 4$</p> <p>D: $\{x x \in \mathbb{R}\}$</p> <p>R: $\{y y > -4\}$</p> <p>Asymptote: $y = -4$</p> <p>End Behavior: $x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow -4$</p>	<p>Parent: $y = 2^x$</p> <p>Shift from parent: left 1 down 4</p>	<p>6) $y = \frac{1}{2}^{x-5} + 1$</p> <p>D: $\{x x \in \mathbb{R}\}$</p> <p>R: $\{y y > 1\}$</p> <p>Asymptote: $y = 1$</p> <p>End Behavior: $x \rightarrow \infty, y \rightarrow 1$ $x \rightarrow -\infty, y \rightarrow \infty$</p>	<p>Parent: $y = \frac{1}{2}^x$</p> <p>Shift from parent: right 5 up 1</p>

Equation	Sketch	Equation	Sketch
<p>7) $y = \frac{1}{2}(4)^{x+3} - 1$</p> <p>D: $\{x x \in \mathbb{R}\}$ R: $\{y y > -1\}$ Asymptote: $y = -1$</p> <p>End Behavior: $x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow -1$</p>	<p>Parent: $y = 4^x$ Shift from parent: vert. st. $\frac{1}{2}$ left 3 down 1</p>	<p>10) $y = 2\left(\frac{1}{2}\right)^{-x+4} - 4$</p> <p>D: $\{x x \in \mathbb{R}\}$ R: $\{y y > -4\}$ Asymptote: $y = -4$</p> <p>End Behavior: $x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow -4$</p>	<p>Parent: $y = \frac{1}{2}^x$ or $y = 2^x$ Shift from parent: v.s. 2 roya right 4 down 4</p>
<p>8) $y = 3\left(\frac{1}{2}\right)^x - 6$</p> <p>D: $\{x x \in \mathbb{R}\}$ R: $\{y y > -6\}$ Asymptote: $y = -6$</p> <p>End Behavior: $x \rightarrow \infty, y \rightarrow -6$ $x \rightarrow -\infty, y \rightarrow \infty$</p>	<p>Parent: $y = \frac{1}{2}^x$ Shift from parent: vert. st. 3 down 6</p>	<p>11) $y = 2^{-2x-6} + 1$ $= 2^{-2(x+3)} + 1$</p> <p>D: $\{x x \in \mathbb{R}\}$ R: $\{y y > 1\}$ Asymptote: $y = 1$</p> <p>End Behavior: $x \rightarrow \infty, y \rightarrow \frac{1}{\infty}$ $x \rightarrow -\infty, y \rightarrow \infty$</p>	<p>Parent: $y = 2^x$ Shift from parent: roya horiz. comp. $\frac{1}{2}$ left 3 vpl</p>
<p>9) $y = \frac{1}{4}(2)^{x+3} - 4$</p> <p>D: $\{x x \in \mathbb{R}\}$ R: $\{y y > -4\}$ Asymptote: $y = -4$</p> <p>End Behavior: $x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow -4$</p>	<p>Parent: $y = 2^x$ Shift from parent: vert. st. $\frac{1}{4}$ left 3 down 4</p>	<p>12) $y = \frac{1}{3}(3)^{x+5} - 5$</p> <p>D: $\{x x \in \mathbb{R}\}$ R: $\{y y > -5\}$ Asymptote: $y = -5$</p> <p>End Behavior: $x \rightarrow \infty, y \rightarrow \infty$ $x \rightarrow -\infty, y \rightarrow -5$</p>	<p>Parent: $y = 3^x$ Shift from parent: vert. comp. $\frac{1}{3}$ left 5 down 5</p>