~WARMUP~

Complete #1 and 2 on your own graph paper.

1. $y = 2(\frac{1}{2})^{-x-6} - 3$ $= 2\left(\frac{1}{2}\right)^{-1(x+6)} - 3$ $= 2(2)^{x+6} - 3$

Domain: $\{x \mid x = \mathbb{R}\}$

Range: $\{y \mid y > -3\}$

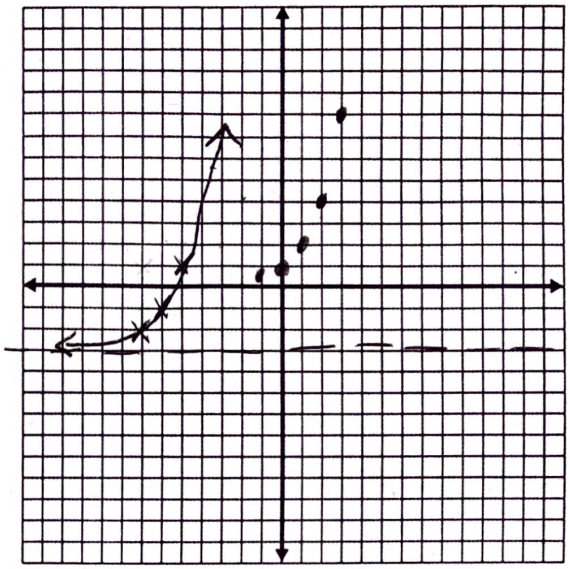
Asymptote: $y = -3$

V.St. 2
left 6
down 3

End Behavior:

$x \to \infty$ $y \to \infty$

$x \to -\infty$ $y \to -3$

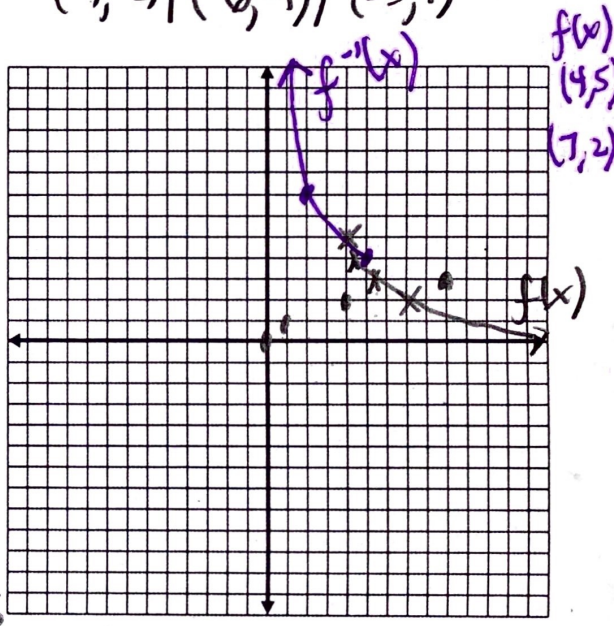


$(-7,-2)$ / $(-6,-1)$ / $(-5,1)$

2. $f(x) = -\sqrt{3x-12} + 5 = -\sqrt{3(x-4)} + 5$

Graph *f(x)*. Also, graph $f^{-1}(x)$.

ROXA
h comp $\frac{1}{3}$
R 4
VP 5



Is *f(x)* one-to-one? yes

Domain of *f(x)*: $\{x \mid x \geq 4\}$

Range of *f(x)*: $\{y \mid y \leq 5\}$

Write the equation of $f^{-1}(x)$. $x = -\sqrt{3y-12} + 5$

$x - 5 = -\sqrt{3y-12}$

$(-x+5)^2 = \left(\sqrt{3y-12}\right)^2$

$(-x+5)^2 = 3y - 12$

$\frac{(-x+5)^2}{3} + \frac{12}{3} = \frac{3y}{3}$

$\frac{1}{3}(-x+5)^2 + 4 = f^{-1}(x)$

$x \leq 5$

Evaluate.

3. $\log_{\sqrt{5}} 125$ $\sqrt{5}^x = 125$ $5^{\frac{1}{2}x} = 5^3$ $x = 6$

4. $\log_2 0$ $2^x = 0$ undefined

Solve.

5. $\log_{\sqrt{x}} 64 = 3$ $\left(x^{\frac{3}{2}}\right)^{\frac{2}{3}} = 64^{\frac{2}{3}}$ $\sqrt{x}^3 = 64$ $x = 4^2 = 16$

6. $\log_x \frac{1}{16} = -2$ $\left(x^{-2}\right)^{-\frac{1}{2}} = \left(\frac{1}{16}\right)^{-\frac{1}{2}}$ $x = 16^{\frac{1}{2}} = 4$

7. What is a logarithm?