

Questions from Homework

$$\textcircled{2} \text{ c) } \left[\sqrt{3x+15} \right]^2 = \left[1 + \sqrt{18+x} \right]^2$$

$$3x+15 = 1 + 2\sqrt{18+x} + 18+x$$

$$3x+15 = 19 + x + 2\sqrt{18+x}$$

$$2x - 4 = 2\sqrt{18+x}$$

$$x - 2 = \sqrt{18+x}$$

$$\left[x - 2 \right]^2 = \left[\sqrt{18+x} \right]^2$$

$$x^2 - 4x + 4 = 18 + x$$

$$x^2 - 5x - 14 = 0$$

$$(x-7)(x+2) = 0$$

$$\begin{array}{l|l} x-7=0 & x+2=0 \\ \hline \boxed{x=7} & x=-2 \end{array}$$

not a solution

$$\textcircled{4} \text{ b) } f(x) = \frac{x^2 - 2x - 3}{x^2 + 6x + 8} = \frac{(x-3)(x+1)}{(x+4)(x+2)}$$

zeros of num.

- ① x int ($y=0$) ② y int ($x=0$) ③ VA: zeros of denom.

$$x = -1, 3$$

$$y = -\frac{3}{8}$$

$$x = -4, -2$$

$$(-1, 0) + (3, 0)$$

$$(0, -\frac{3}{8})$$

$$\lim_{x \rightarrow -4^-} f(x) = +\infty$$

$$\lim_{x \rightarrow -4^+} f(x) = -\infty$$

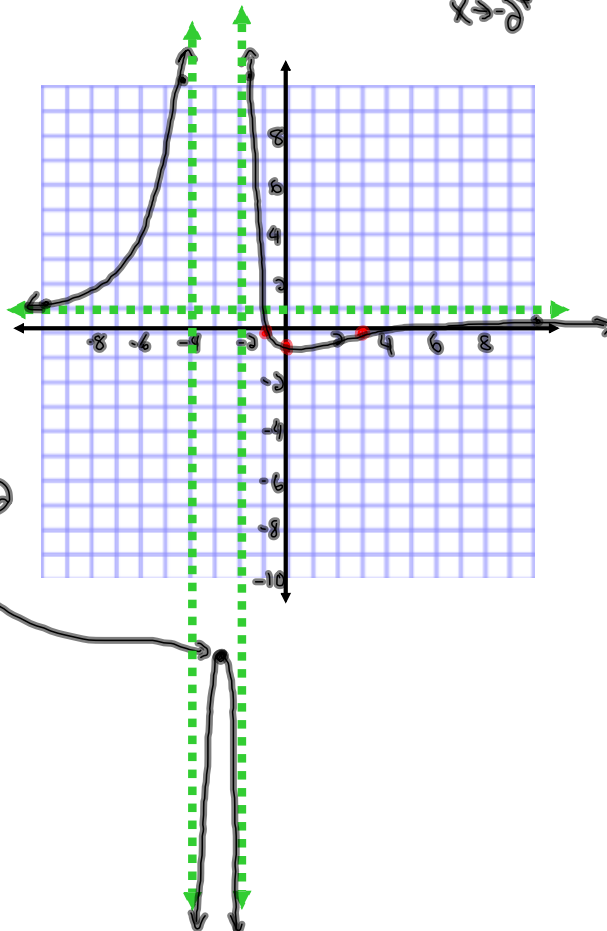
$$\lim_{x \rightarrow -2^-} f(x) = -\infty$$

$$\lim_{x \rightarrow -2^+} f(x) = +\infty$$

- ④ H.A. compare the degree of num and denom

$$y = 1$$

- ⑤ Holes: None



$$\neq f(-3) = -12$$

Logarithms

1. Express each equation in exponential form:

a) $\log 65 = 1.8129$

$$10^{1.8129} = 65$$

b) $\log_2\left(\frac{1}{32}\right) = -5$

$$2^{-5} = \frac{1}{32}$$

2. Express each equation in logarithmic form:

a) $9 = 81^{\frac{1}{2}}$

$$\log_{81} 9 = \frac{1}{2}$$

b) $10^{-2} = 0.01$

$$\log 0.01 = -2$$

3. Evaluate.

a) $\log_3 81$

$$3^y = 81$$

$$3^y = 3^4$$

$$\boxed{y = 4}$$

b) $\log_8 \frac{1}{4}$

$$8^y = \frac{1}{4}$$

$$(2^3)^y = 2^{-2}$$

$$2^{3y} = 2^{-2}$$

$$3y = -2$$

$$\boxed{y = -\frac{2}{3}}$$

4. Solve each equation for x .

a) $\log_4(2x-1) = 3$

$$4^3 = 2x-1$$

$$64 = 2x-1$$

$$65 = 2x$$

$$\boxed{\frac{65}{2} = x}$$

b) $\log_3(\log_2 512) = x$

$$* \log_2 512$$

$$2^y = 512$$

$$2^y = 2^9$$

$$y = 9$$

$$\log_3 9 = x$$

$$3^x = 9$$

$$3^x = 3^2$$

$$\boxed{x = 2}$$

5. Use the laws of logarithms to rewrite each expression in a form with no logarithms of products, quotients, or powers or roots.

$$\log_2 \frac{x^2 y^3}{\sqrt{z}}$$

$$= \log_2 x^2 + \log_2 y^3 - \log_2 \sqrt{z}$$

$$= \log_2 x^2 + \log_2 y^3 - \log_2 z^{1/2}$$

$$= 2 \log_2 x + 3 \log_2 y - \frac{1}{2} \log_2 z$$