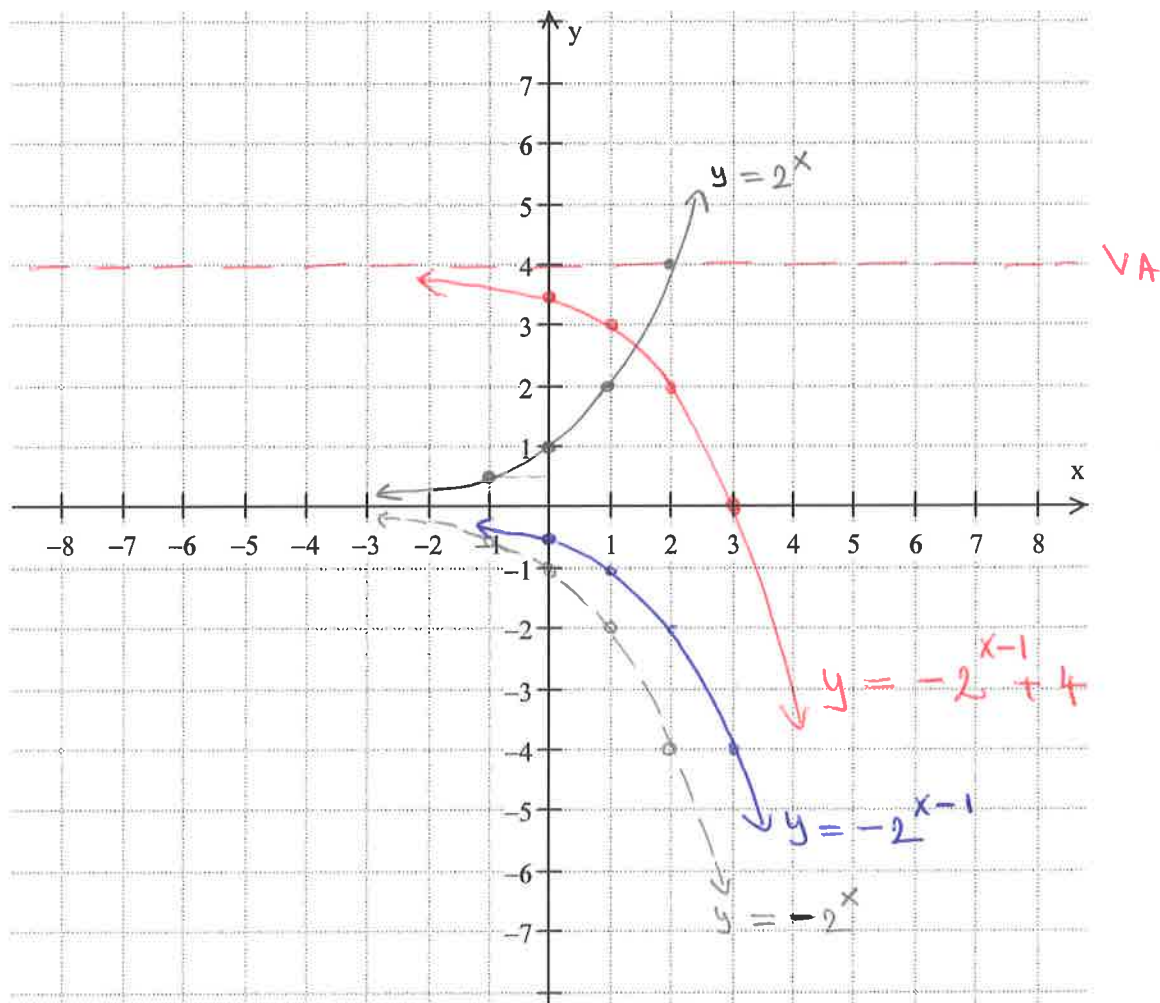


**MHF4U**  
**Exponential and Logarithmic Functions**

1. Let  $y = f(x) = -2^{x-1} + 4$

Find:

- a) Domain  $\mathbb{R}$
- b) Range  $(-\infty, 4)$
- c) x-int  $4 = 2^{x-1}$  ;  $x-1 = 2$   $\therefore x-1 = 3$
- d) y-int  $= f(0) = -\frac{1}{2} + 4 = \frac{7}{2}$
- e) horizontal asymptote  $y = 4$
- f) vertical asymptote *none*
- g) the graph the function on the grid below by using transformations



h) the inverse function  $f^{-1}(x)$

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

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

$$2^{y-1} = 4 - x$$

$$y-1 = \log_2(4-x)$$

$$y = 1 + \log_2(4-x)$$

$$\therefore f^{-1}(x) = 1 + \log_2(4-x)$$

2. Let  $y = f(x) = 2\log_{0.5}(x+2) - 2$

Find:

i) Domain  $(-2, \infty)$

j) Range  $\mathbb{R}$

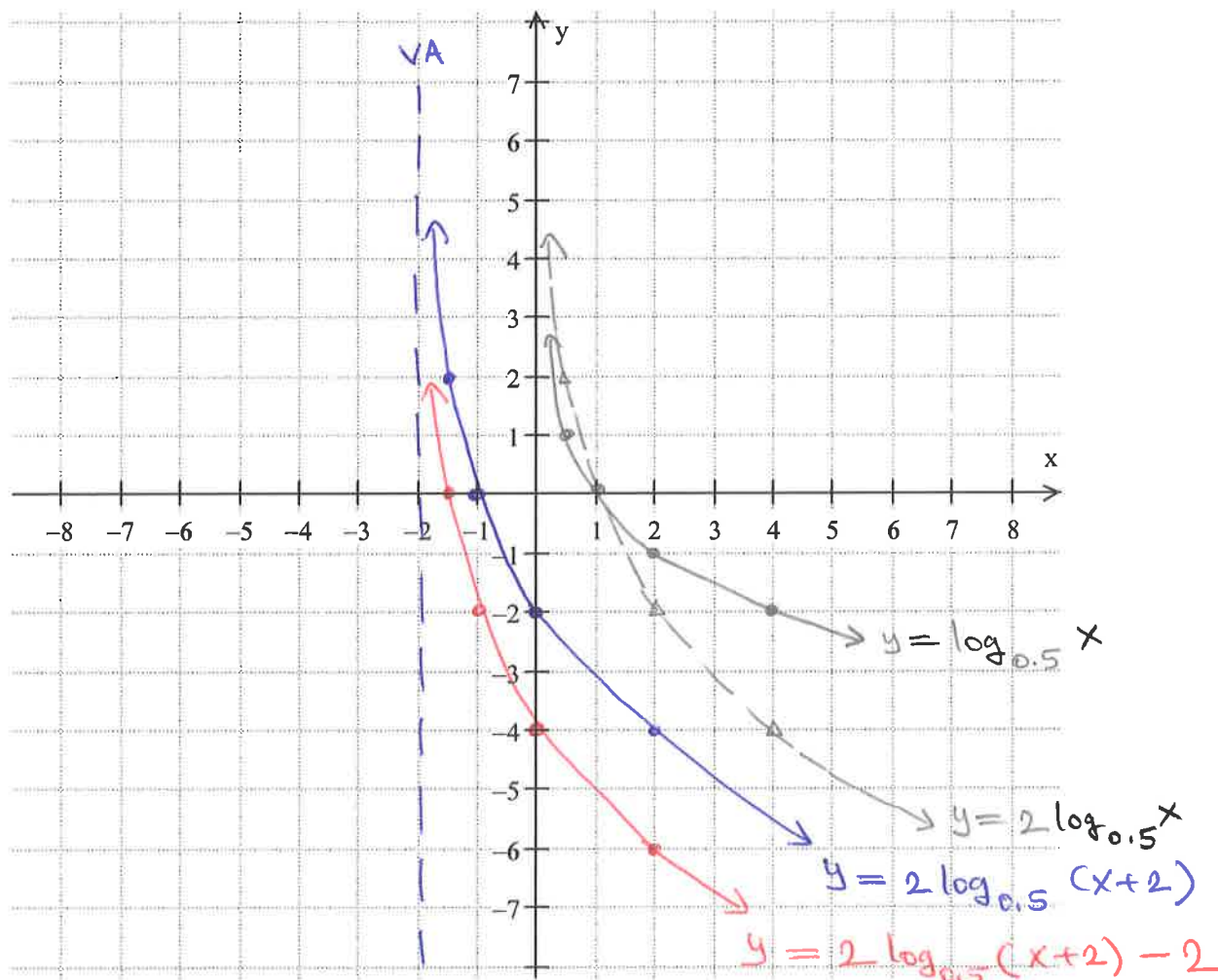
k) x-int  $2 = 2\log_{0.5}(x+2) \Rightarrow 0.5^1 = x+2 \Rightarrow x\text{-int} = -1.5$

l) y-int  $= f(0) = 2\log_{0.5} 2 - 2 = -4$

m) horizontal asymptote none

n) vertical asymptote  $x = -2$

o) the graph the function on the grid below by using transformations



p) the inverse function  $f^{-1}(x)$

$$y = 2\log_{0.5}(x+2) - 2$$

$$x = 2\log_{0.5}(y+2) - 2$$

$$2\log_{0.5}(y+2) = +2+x$$

$$\log_{0.5}(y+2) = +1 + \frac{x}{2}$$

$$0.5^{+1+x/2} = y+2$$

$$y = -2 + 0.5^{+1+x/2}$$

$$f^{-1}(x) = -2 + 0.5^{+1+x/2}$$