

1. $y = 4^x$ original function ($f(x) = 4^x$)

a) $y = 4^{x+2}$
 $y = f(x)+2$ shift $y = 4^x$ up 2

b) $y = 4^{-x}$
 $y = f(-x)$ reflect in y -axis

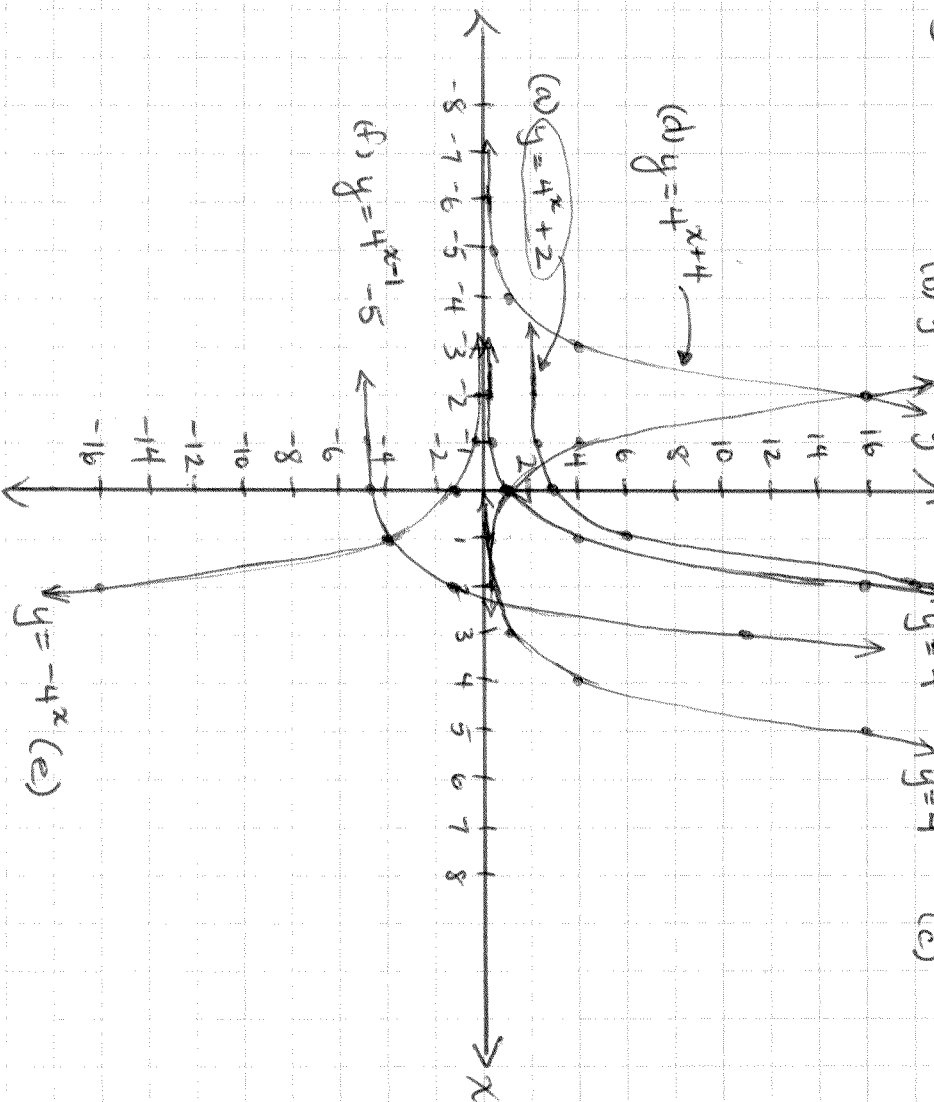
c) $y = 4^{x-3}$
 $y = f(x-3)$ shift right 3

d) $y = 4^{x+4}$
 $y = f(x+4)$ shift left 4

e) $y = -4^x$
 $y = -f(x)$ reflect in x -axis

f) $y = 4^{x-1}-5$

g) $y = f(x-1)-5$ shift right 1 and down 5
 (b) $y = 4^x$
 (c) $y = 4^{x-3}$



3. original function $y = 5^x$
 $f(x) = 5^x$

a) down 3 units

$$y = f(x) - 3$$

$$y = 5^x - 3$$

b) right 2 units

$$y = f(x - 2)$$

$$y = 5^{x-2}$$

c) reflect in x-axis

$$y = -f(x)$$

$$y = -5^x$$

d) left $\frac{1}{2}$ unit

$$y = f\left(x + \frac{1}{2}\right)$$

$$y = 5^{x + \frac{1}{2}}$$

OR

$$y = 5^{\frac{2x+1}{2}}$$

e) reflect in y-axis
 and up 2 units

$$y = f(-x) + 2$$

$$y = 5^{-x} + 2$$

f) shift up 1 and
 left 2.5 units

$$y = f(x + 2.5) + 1$$

$$y = 5^{x+2.5} + 1$$

OR

$$y = 5^{\frac{2x+5}{2}} + 1$$