No.3 TRANSFORMATIONS OF FUNCTIONS ASSIGNMENT.

Ans 1. $y = -f\left(\frac{1}{3}x + 9\right) + 8.$

a) (i) Horizontaly elongate
(ii) Move the function nine units to the left
(iii) Eight units upwards.
(iv) Take reflection of the graph about x-axis.

b) Yes, there are other sequence of transformations that are possible.
→ We can workout on a and d.
and then on a and c

where $a = -1$, $d = -9$, $c = 8$.

Ans 2. Elongate vertically by 3 units.
then translated up and down by eight units and nine units to the right.

$$y = f(x)$$

(i) stretch by factor a then

$$y = af(x)$$

(ii) Translated f by d then

$$y = a f(x) + d.$$

(iii) Shifted left by factor of c then

$$y = af[x + c] + d.$$

Example - If $y = f(x) = \frac{1}{x}$

a) Move 2 spaces up $= h(x) = \frac{1}{x} + 2$

b) Move 3 spaces down $= h(x) = \frac{1}{x} - 3$

c) Move 4 spaces to the right $= h(x) = \frac{1}{(x-4)}$

d) Move 5 spaces to the left $= h(x) = \frac{1}{(x+5)}$

e) Stretch it by 2 in the y-direction. $= h(x) = \frac{2}{x}$

f) Compress it by 3 in the y direction $= h(x) = \frac{1}{(3x)}$

g) Flip it upside down $= h(x) = \frac{-1}{x}$.