Write the exponential functions in the form $y = a(b)^x + q$.

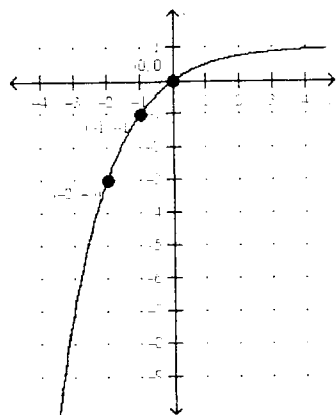| Example 1:	Example 2:
Determine the equation of the exponential function with a common ratio of 3, a y-intercept of 5 and a horizontal asymptote $y = -2$.	Use the graph to determine the equation of the exponential function.

Example 1:

Solution:

$y = a(b)^x + q$ $b = 3$ and $q = -2$

$y = a(3)^x - 2$ sub in pt $(0, 5)$

$5 = a(3)^0 - 2$

$7 = a(1)$

$\therefore a = 7$

$y = 7(3)^x - 2$ is the equation of the exponential function.

Example 2:

$y = a(b)^x + q$

$q = 1$

Determine common ratio of 1st differences. Sub in a point to get a.

The equation is $y = -\left(\dfrac{1}{2}\right)^x + 1$.

Exercise:

1. Determine the equation of the exponential function with a common ratio of 2, a horizontal asymptote $y = 4$ and passing through the point $(2, 10)$.

2. Determine the equation of the exponential function with a common ratio of 3, a horizontal asymptote $y = -4$ and a y-intercept of -6.

3. Determine the equations of the exponential functions represented by the graphs below:

a)	b)	c)
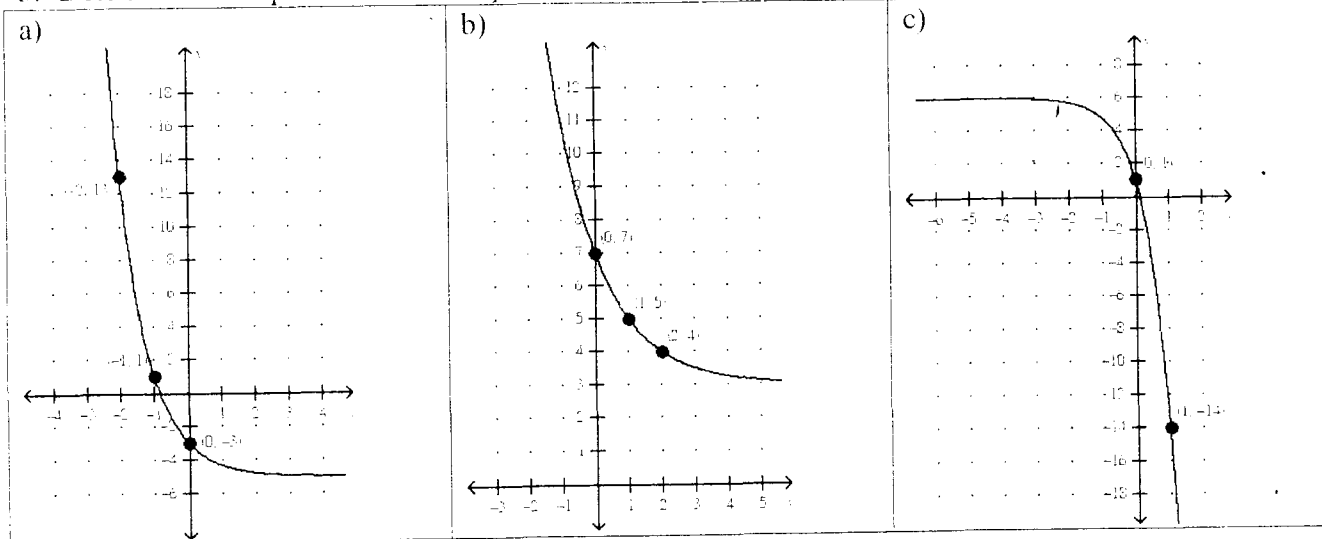
Answers:

1. $y = 1.5(2)^x + 4$ or $y = 3(2)^{x-1} + 4$ 2. $y = -2(3)^x - 4$ 3. a) $y = 2\left(\dfrac{1}{3}\right)^x - 5$ b) $y = 4\left(\dfrac{1}{2}\right)^x + 3$ c) $y = -5(4)^x + 6$