

# TRANSFORMATION OF EXPONENTIAL FUNCTIONS

Step 1

Q1. Given  $y^{\circ}$  intercept = 5.

i.e. a point  $(0, 5)$  lies on the graph.

When  $x = 0$ ,  $y = 5$ .

Step 2

$y$  Intercept = 5

i.e.  $y = 5$ .

Step 3

Let us take one function  $y = 2^x$

By putting the value  $x = 0$

$$y = 2^0 = 1$$

Step 4

Given asymptote = 3

The function should be  $y = 2^{x+3}$

Step 5

When we put  $x = 0$ ,  $y = 2^0 + 3 = 1 + 3 = 4$ .

## Step 6

At  $x = 0$ ,  $y = 5$

So, we need to multiply by 2  
in the first term.

i.e.  $y = 2 \cdot 2^x + 3$

or

$$y = 2^{x+1} + 3$$

## For other equation

In the above function the base of  $x$  does not have any impact on the intercept as well as asymptote. So, it may be any value and we can write the second function with the same intercept and asymptote

as  $y = 2 \cdot a^x + 3$ .