

LOGISTIC FUNCTIONS

(1-4) For each logistic function below, identify $\lim_{x \rightarrow \infty} f(x)$, $\lim_{x \rightarrow -\infty} f(x)$, graph $f(x)$, and graph the horizontal asymptote corresponding to the upper limit value.

1. $f(x) = \frac{2.5}{1+3^{-x}}$

2. $f(x) = \frac{1.5}{1+\left(\frac{1}{3}\right)^{-x}} = \frac{1.5}{1+3^x}$

3. $f(x) = \frac{3.5}{1+e^{-x}}$

4. $f(x) = \frac{4.5}{1+2e^x}$

5. Find the logistic function in the form $f(x) = \frac{C}{1+A \cdot B^{-x}}$ if it has an upper limit value of 6 and passes through the points (0,3) and (1,4).

6. Find the logistic function in the form $f(x) = \frac{c}{1+ae^{-bx}}$ that best fits the data below. Round a , b , and c to the nearest hundredth.

x	0	20	40	60	80	100
y	2.1	3.6	5.0	6.1	6.8	6.9