Drugs in the Bloodstream *If a drug is injected into the bloodstream, the percent of the maximum dosage that is present at time t is given by*

$$y = 100\left(1 - e^{-0.35(10-t)}\right)$$

where t is in hours, with $0 \leq t \leq 10$. [1]

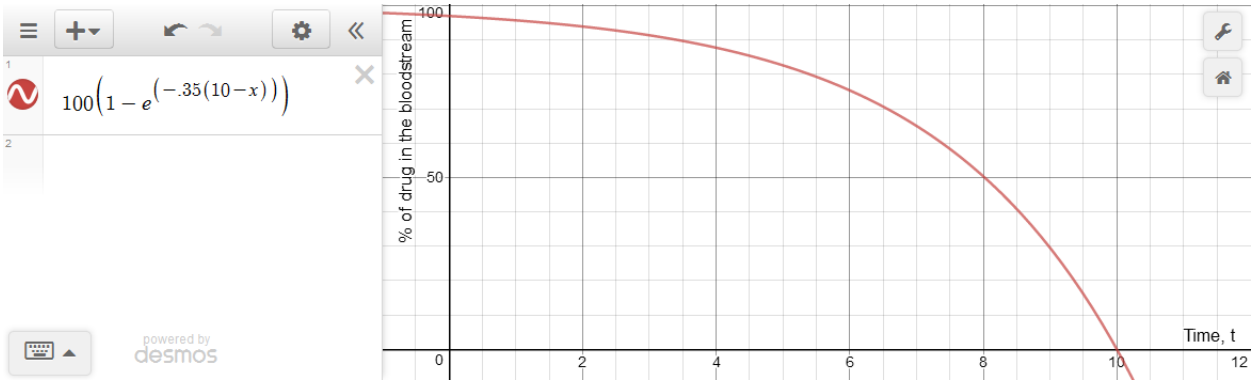
a. *What percent of the drug is present after 2 hours?*

Let $t = 2$ and solve for y.

$$\begin{aligned} y &= 100\left(1 - e^{-0.35(10-t)}\right) \\ y &= 100\left(1 - e^{-0.35(10-2)}\right) \\ &= 100\left(1 - e^{-0.35(8)}\right) \\ &= 100\left(1 - e^{-2.8}\right) \\ &\approx 100\left(1 - 0.06081\right) \\ &\approx 100\left(0.93919\right) \\ &\approx 93.919 \end{aligned}$$

After 2 hours 93.92% of the drug will remain in the bloodstream.

b. *Graph this function.*

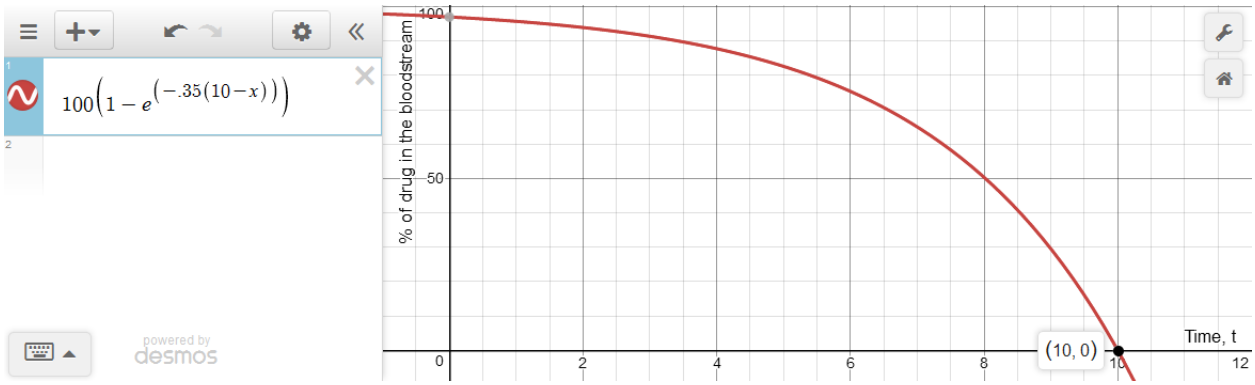


c. *When is the drug totally gone from the bloodstream?*

The drug is totally gone from the bloodstream when $y\%$ equals zero. This is where the graph of y crosses the x-axis.

We can see that this happens when $t = 10$ and say that after 10 hours the drug is totally gone from the bloodstream.

[1] Harshbarger/Yocco, *College Algebra In Context, 5e*, p. 326, #54.


$100\left(1-e^{(-.35(10-x))}\right)$
powered by desmos
% of drug in the bloodstream
100
50
0
2
4
6
8
10
12
Time, t
(10, 0)