

Question 8

A certain medication is administered intravenously and metabolized by the body over time. The amount of the drug in the bloodstream (in milligrams) is modeled by the function:

$$C(t) = 80e^{-0.35t}$$

where t is the number of hours after the drug is administered.

- (a) What is the amount of the drug in the bloodstream after 2 hours?
- (b) After how many hours will only 10 mg remain in the bloodstream?
- (c) What percentage of the drug is lost every hour?

Round all answers to two decimal places.

Question 8 - Solution

Use the exact exponential model and keep full precision until the final rounding.

(a)

$$C(2) = 80e^{-0.7}$$

39.73 mg

(b)

$$t = \ln(80/10)/0.35$$

5.94 hours

(c)

$$100(1 - C(t+1)/C(t)) = 100(1 - e^{-0.35})$$

29.53 %
