

Problems of the Month

September 2016

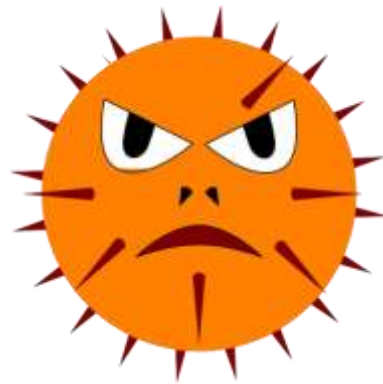


General Problem:

A shelf measures 18 inches deep by 36 inches wide and 20 inches tall. A certain cereal box measures 10 inches wide, 2 inches thick, and 12 inches high. How many full cereal boxes can the shelf hold? How are they oriented?

Calculus Problem:

A certain pathogen has infected the blood stream of a person. It is known that the amount of pathogen is going to roughly follow the function $f(t) = 100(e^{-0.1t} - e^{-0.4t})$ miligrams where t is the amount of time since infection. It is known that 50mg of the pathogen can be toxic to the body. Will the pathogen ever become toxic? Justify your answer.



Challenge Problem:

Two players will play a game: a coin is going to be flipped until either two heads appear in a row (HH) or a heads is followed by a tails (HT). In the event of a HH, Alice wins. In the event of a HT, Bob wins. What is the probability that Alice wins?

