

CHAPTER 7 PROJECT

Exponential Functions



Computer viruses cause enormous economic harm to businesses through costs associated with preventive measures, data recovery, and damaged equipment and reputation. The speed at which viruses can spread makes it difficult to manage an attack.

Suppose a new virus has been created and initially infects 100 computers in a large corporation through a single email. Let $t = 0$ be the time of the initial infection, and suppose the number of computers infected in the corporation doubles every 47 minutes. The infection is finally brought under control 6 hours later.

1. How many computers are infected at the 1 hour mark?
2. How many computers are infected after another 30 minutes?
3. How many computers are infected when the virus is finally brought under control?
4. A second virus is detected a week later, and the number of computers it infects t minutes after initial infection is estimated to be $50e^{\frac{t}{110}}$. To the nearest minute, what is the doubling time for this virus?