**Activity 5.6.3 Rumors, Worms, and Viruses**

What do rumors, worms, and viruses have in common? Besides the potential for causing devastation, rumors, worms (computer malware), and contagious viruses can be modeled by geometric series.

**Situation 1: Rumors (Before Technology)**

Gabby and Izzy decided to spread a malicious rumor about another student. After two hours, Gabby and Izzy had each told four people. After two more hours, each of the people who just heard the rumor had spread it to four new people. This pattern continued for 10 more hours.

1. Write a finite geometric series representing the number of people who heard the rumor within fourteen hours.
2. Use the geometric sum formula to determine the total number of people who heard the rumor in the 14 hours.

**Situation 2: Sharing in the Age of Social Media**

Darius posted a photo on his favorite social media site. Within the first ten minutes, the photo had been shared by 8 of his friends. Within the next 10 minutes, for each of Darius’s friends who shared the photo, 8 of their friends also shared the photo. This pattern happened for one and a half hours. How many times had the photo been shared within one and a half hours?

**Situation 3: Worms!**

A worm is a malicious computer program that replicates itself and spreads to other computers. Once the worm is on a computer, it seeks out 5 addresses for new victims. One hour is needed to transmit the worm to a new user, locate 5 addresses and begin the process again. Assuming the work starts with just one user on a single computer, how many addresses are victimized within a twelve hour period?

**Situation 4: Viruses**

In recent years, the Ebola virus has created scares around the world. In one country, 10 patients were diagnosed with the virus on June 5. Each day, the number of new patients increased by approximately 12.2%.

1. Approximately how many people contracted the virus by June 20?
2. Approximately how many people contracted the Ebola virus by July 5?