Determine whether the following sequences are arithmetic, geometric, or other. If arithmetic or geometric, identify the common difference or common ratio, write the explicit and recursive formula, and find the 10th term.

1) $\frac{5}{3}$, 5, 15, 45,...

2) 1, 4, 9, 16,...

3) -45, -61, -77, -93,...

4) -3, 1, 5, 9,...

5) -30, 15, -7.5, 3.75,...

For each geometric sequence, write the recursive and explicit formulas. Then find the 8th term.

6) $a_1 = 4, \ r = -3$

7) $a_1 = -\frac{1}{4}, \ r = -12$

8) $a_1 = -2, \ r = \frac{1}{6}$

9) $a_1 = 90, \ r = -\frac{1}{3}$

Write an explicit formula for the following situations and use it to answer the questions.

10) The end of a spring is pulled as far as it will go and then is released. On the first bounce back it extends 54 cm. On its second bounce back it extends 18 cm. On its third bounce back it extends 6 cm. How long does the spring extend after 7, 8, 9, and 10 bounce backs?

11) Gordon Moore, co-founder of Intel, suggested that the number of transistors on a square inch of integrated circuit in a computer chip would double every 18 months. If the number of transistors on a square inch of integrated circuit started at 10, find the number of transistors over the course of the next 10 years.

12) A culture of bacteria doubles every 2 hours. If there are 500 bacteria at the beginning, how many bacteria will there be after 24 hours? Graph this situation.