Lesson 25 Practice Problems

1. The formula for the sum s of the first n terms in a geometric sequence is given by $s = a\left(\frac{1-r^n}{1-r}\right)$, where a is the initial value and r is the common ratio.

   A drug is prescribed for a patient to take 120 mg every 12 hours for 8 days. After 12 hours, 6% of this drug is still in the body. How much of the drug is in the body after the last dose?

2. The formula for the sum s of the first n terms in a geometric sequence is given by $s = a\left(\frac{1-r^n}{1-r}\right)$, where a is the initial value and r is the common ratio. If a sequence has $a = 10$ and $r = 0.25$,

   a. What are the first 4 terms of the sequence?

   b. What is the sum of the first 17 terms of the sequence?

3. Jada drinks a cup of tea every morning at 8:00 a.m. for 14 days. There is 40 mg of caffeine in each cup of tea she drinks. 24 hours after she drinks the tea, only 6% of the caffeine is still in her body.

    a. How much caffeine is in her body right after drinking the tea on the first, second, and third day?

    b. When will the total amount of caffeine in Jada be the highest during the 14 days? Explain your reasoning.

4. Select **all** polynomials that have $(x + 1)$ as a factor.

    A. $f(x) = x^3 + 2x^2 - 5x - 6$

    B. $g(x) = x^3 - 7x + 6$

    C. $h(x) = x^3 - 2x^2 - 5x + 6$

    D. $j(x) = x^3 - 7x - 6$

    E. $k(x) = x^2 - 1$

(From Unit 2, Lesson 15.)

5. A car begins its drive in heavy traffic and then continues on the highway without traffic. The average cost (in dollars) of the gas this car uses per mile for driving x miles is $c(x) = \frac{0.65+0.15x}{x}$. As x gets larger and larger, what does the end behavior of the function tell you about the situation?

(From Unit 2, Lesson 18.)

6. Write a rational equation that cannot have a solution at $x = 2$.

(From Unit 2, Lesson 22.)

7. For x-values of 0 and -1, $(x + 1)^3 = x^3 + 1$. Does this mean the equation is an identity? Explain your reasoning.

(From Unit 2, Lesson 24.)