Lesson 1.3: Geometric Sequences

Complete the *Practice* below. When you have completed all the questions for *Lesson 1.3 Practice – VI* with your best work, mark your work by first comparing your answers to the solutions provided in the *Appendix*. Then, apply the rubric found at the beginning of the *Workbook*.

Practice – VI

1. Determine the number of terms, n, in the geometric sequence $25, -5, 1, ..., -0.008$.

2. A flower shop owner promises that their flowers will last for one week, and offers a money-back guarantee. In reality, the flowers lose 2% of their vibrancy each day.

   a. What percent of the original colour do the flowers have at the end of one week (7 days)? Note the flowers will have 100% vibrancy on the first day.

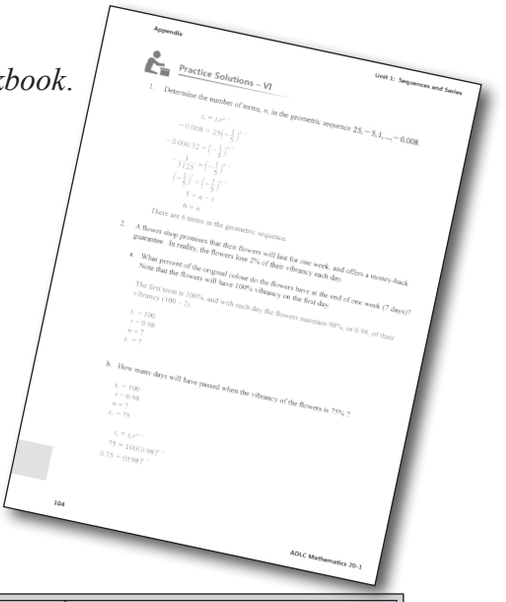
b. How many days will have passed when the vibrancy of the flowers is 75%?

c. What assumption is made in order to answer part b.?

Mark your work for *Lesson 1.3 Practice – VI* using the solutions provided in the *Appendix*. Then, apply the rubric found at the beginning of the *Workbook*.

Transfer your self-assessed mark to the front cover of the *Workbook*.

My self-assessed mark on *Lesson 1.3 Practice – VI* is _____.


Appendix

Practice Solutions – VI

Unit 1: Sequences and Series

1. Determine the number of terms, n, in the geometric sequence $25, -5, 1, \ldots, -0.008$.

$t_n = ar^{n-1}$

$-0.008 = 25\left(-\frac{1}{5}\right)^{n-1}$

$-0.000\,32 = \left(-\frac{1}{5}\right)^{n-1}$

$-\frac{1}{3\,125} = \left(-\frac{1}{5}\right)^{n-1}$

$\left(-\frac{1}{5}\right)^5 = \left(-\frac{1}{5}\right)^{n-1}$

$5 = n-1$

$6 = n$

There are 6 terms in the geometric sequence.

2. A flower shop promises that their flowers will last for one week, and offers a money-back guarantee. In reality, the flowers lose 2% of their vibrancy each day.

a. What percent of the original colour do the flowers have at the end of one week (7 days)? Note that the flowers will have 100% vibrancy on the first day.

The first term is 100%, and with each day the flowers maintain 98%, or 0.98, of their vibrancy ($100 - 2$).

$t_1 = 100$

$r = 0.98$

$n = 7$

$t_7 = ?$

b. How many days will have passed when the vibrancy of the flowers is 75% ?

$t_1 = 100$

$r = 0.98$

$n = ?$

$t_n = 75$

$t_n = ar^{n-1}$

$75 = 100(0.98)^{n-1}$

$0.75 = (0.98)^{n-1}$

104

ADLC Mathematics 20-1

Reflect on your understanding of the concepts addressed in the *Practice* exercises in the table provided.

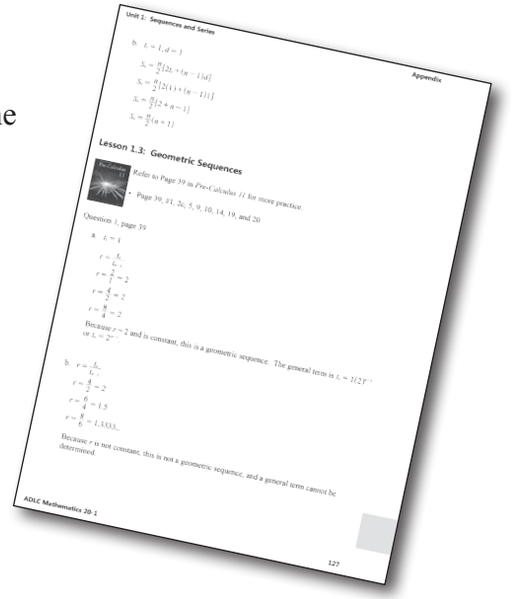
Question Number	Got it!	Almost there…	Need to retry or ask for help.	Similar questions from Pre-Calculus 11
1				p. 40 #9d, 10e, 19b
2				p. 40 #9, 10, 14, 19, 20

You may proceed to *Explore Your Understanding Assignment* on the next page of this *Workbook*.

Note: Before you complete *Explore Your Understanding*, you may review your skills and get more practice by completing the following problems in *Pre-Calculus 11*.

- Page 39 #1, 2c, 5, 9, 10, 14, 19, and 20

Check your work in *Enhance Your Understanding*.


Unit 1: Sequences and Series

Appendix

b. $t_1 = 1, d = 1$

$S_n = \frac{n}{2}[2t_1 + (n-1)d]$

$S_n = \frac{n}{2}[2(1) + (n-1)1]$

$S_n = \frac{n}{2}[2 + n - 1]$

$S_n = \frac{n}{2}(n+1)$

Lesson 1.3: Geometric Sequences

Refer to Page 39 in *Pre-Calculus 11* for more practice.

- Page 39, #1, 2c, 5, 9, 10, 14, 19, and 20

Question 1, page 39

a. $t_1 = 1$

$r = \frac{t_2}{t_1}$

$r = \frac{2}{1} = 2$

$r = \frac{4}{2} = 2$

$r = \frac{8}{4} = 2$

Because $r = 2$ and is constant, this is a geometric sequence. The general term is $t_n = 1(2)^{n-1}$ or $t_n = 2^{n-1}$.

b. $r = \frac{t_2}{t_1}$

$r = \frac{3}{2} = 2$

$r = \frac{6}{4} = 1.5$

$r = \frac{8}{6} = 1.3333...$

Because r is not constant, this is not a geometric sequence, and a general term cannot be determined.

ADLC Mathematics 20-1

127