

Math 114**Sequences & Series / Linear Systems Review**

- [1] You must show the use of the appropriate sequence and/or series formulae.
- [a] Find a_{364} for the arithmetic sequence $-28, -22, -16, -10, -4, \dots$.
- [b] Find a_{20} for the geometric sequence $5, -10, 20, -40, 80, \dots$.
- [c] Find a_{248} for the arithmetic sequence with $a_3 = 20$ and $a_{10} = -3$.
- [d] Find the sum of the first 425 terms of the sequence in part [a].
- [e] Find the sum of the first 15 terms of the sequence in part [b].
- [f] Find the sum of the infinite geometric series $\frac{9}{20} - \frac{3}{10} + \frac{1}{5} \dots$.
- [g] Convert $0.014141414\dots$ to a fraction.
- [h] Find $\sum_{n=1}^{\infty} \frac{5}{2(3)^{n+1}}$.
- [2] You started a new job which paid \$3,000 per month. After exactly 6 years, you left the job.
- [a] If you received a 0.4% raise each month, what was your monthly pay when you left?
- [b] If you received a \$12 per month raise each month, what was your monthly pay when you left?
- [c] In part [a], how much were you paid during the 6 years?
- [d] In part [b], how much were you paid during the 6 years?
- [3] You deposit \$2,000 into your retirement account at the beginning of every year for 30 years. The account earns 4.5% interest compounded annually. How much is in the account at the end of the 30 years?
- [4] Solve the system $\begin{matrix} 2x - 3y &= 17 \\ 3x + 4y &= 51 \end{matrix}$ using elimination.

ANSWERS

- [1] [a] 2150 [b] -2621440 [c] -785
 [d] 528700 [e] 54615 [f] $\frac{27}{100}$
 [g] $\frac{7}{495}$ [h] $\frac{5}{12}$
- [2] [a] 3983.04 (a_{72} of geometric sequence with $a_1 = 3000$, $r = 1.004$)
 [b] 3852 (a_{72} of arithmetic sequence with $a_1 = 3000$, $d = 12$)
 [c] 249743.49 (S_{72} of geometric series with $a_1 = 3000$, $r = 1.004$)
 [d] 246672 (S_{72} of arithmetic series with $a_1 = 3000$, $d = 12$)
- [3] 127504.78 (S_{30} of geometric series with $a_1 = 2000(1.045)$, $r = 1.045$ **OR** $a_1 = 2000(1.045)^{30}$, $r = \frac{1}{1.045}$)
- [4] (13, 3)