## <u>Math 114</u> 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  $-28, -22, -16, -10, -4, \cdots$ .
  - [b] Find  $a_{20}$  for the geometric sequence 5, -10, 20, -40, 80, ....
  - [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  $\frac{9}{20} \frac{3}{10} + \frac{1}{5}$ ...
  - [g] Convert 0.014141414... 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 ?

## ANSWERS

[1]	[a]	2150	[b]	-2621440	[c]	- 785
	[d]	528700	[e]	54615	[f]	$\frac{27}{100}$
	[g]	$\frac{7}{495}$	[h]	$\frac{5}{12}$		100

- [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  $a_1 = 2000(1.045)^{30}$ ,  $r = \frac{1}{1.045}$ )