Math 114
Sequences & Series / Linear Systems Review

[1] You must show the use of the appropriate sequence and/or series formulae.

[a] Find a_{36} for the arithmetic sequence $-28, -22, -16, -10, -4, \cdots$.

[b] Find a_{20} for the geometric sequence $5, -10, 20, -40, 80, \cdots$.

[c] Find a_{24} for the arithmetic sequence with $a_3 = 20$ and $a_{10} = -3$.

[d] Find the sum of the first 25 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 $\frac{9}{20} - \frac{3}{10} + \frac{1}{5} \cdots$.

[g] Convert $0.314141414\ldots$ 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 0.3% raise each month, what was your monthly pay when you left ?

[b] If you received a \$10 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 \$2000 into your retirement account every year for 30 years. The account earns 4.5% interest compounded annually. How much is in the account after 30 years ?

[4] Solve the system $\begin{aligned} 2x - 3y &= 17 \\ 3x + 4y &= 51 \end{aligned}$ using elimination.

ANSWERS

[1] [a] 182 [b] -2621440 [c] -49

[d] 1100 [e] 54615 [f] $\frac{27}{100}$

[g] $\frac{311}{990}$ [h] $\frac{5}{12}$

[2] [a] 3710.97 [b] 3710 [c] 240701.13 [d] 241560

[3] 127504.78

[4] $(13, 3)$