CHAPTER 7 Review — MATH 1050

7.1 (7) $a_n = (-1)^n(2n)$

$a_1 = (-1)^1(2\cdot1) = -2$
$a_2 = (-1)^2(2\cdot2) = 4$
$a_3 = (-1)^3(2\cdot3) = -6$
$a_4 = (-1)^4(2\cdot4) = 8$
$a_5 = (-1)^5(2\cdot5) = -10$

(23) $a_1 = -2$
$a_n = a_{n-1} + 3$

$a_1 = -2$
$a_2 = 1$
$a_3 = 4$
$a_4 = 7$

(26) $a_1 = 2$
$a_2 = 5$
$a_n = a_{n-1} + a_{n-2}$

$a_1 = 2$
$a_2 = 5$
$a_3 = 5 + 2 = 7$
$a_4 = 7 + 5 = 12$

(29) $\sum_{i=1}^{5}(2i+1) = [2(1)+1] + [2(2)+1] + [2(3)+1] + [2(4)+1] + [2(5)+1]$

$3 + 5 + 7 + 9 + 11 = 35$

7.2 (3) $3, -2, -7, -12, \cdots$ $d = -5$

(11) $a_3 = 10$, $d = -2$

$a_4 = 8$ $a_5 = 6$
$a_2 = 12$ $a_1 = 14$

14
12
10
8
6

(23) $a_5 = 27$, $a_{15} = 87$

Subtracting n-values
$15 - 5 = 10$
$10d = 87 - 27 = 60$
$d = 6$

$a_n = a_1 + (n-1)d$
$a_5 = a_1 + (5-1)6$
$27 = a_1 + 24$
$3 = a_1$

(45) $1 + 3 + 5 + 7 + 9 + \cdots + 99$

$a_n = a_1 + (n-1)d$
$a_{50} = 1 + (50-1)2 = 99$

$S_n = \frac{n}{2}[a_1 + a_n] \Rightarrow S_{50} = \frac{50}{2}[1 + 99]$
$= 2500$

(71) In each 12-Hour Period,

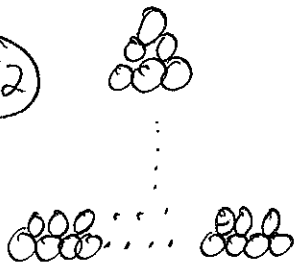
$S_n = \frac{n}{2}[a_1 + a_n] \Rightarrow S_{12} = \frac{12}{2}[1 + 12] = 78$

$1 + 2 + 3 + 4 + \cdots 12$

There 2, 12 Hour Periods per day × 30 Days = 60

$78 \cdot 60 = 4680$ chimes per month.

(72)



$30 + 29 + 28 + 27 + \cdots 1$

$S_n = \frac{n}{2}[a_1 + a_n] = S_{30} = \frac{30}{2}[30 + 1] = 465$

7.3 (11) $-4, -12, -36, -108, \cdots$

$r = \frac{-12}{-4} = 3$

$a_5 = a_4 \cdot r$
$a_5 = -108 \cdot 3 = -324$

$a_n = a_1 \cdot r^{n-1}$
$a_n = -4(3)^{n-1}$

7.3 (17) $a_2 = -6$, $a_7 = -192$

$r^5 = \frac{-192}{-6} = 32$ $\quad r = 2$ $\quad a_1 = \frac{-6}{2} = -3$ (↑ r)

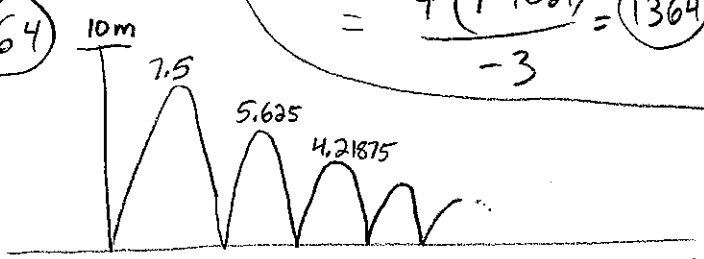
(22) $4, 16, 64, 256, \cdots$ $\quad r = 4$ $\quad$ Find S_5 $\quad S_n = \frac{a_1(1-r^n)}{1-r} \Rightarrow S_5 = \frac{4(1-4^5)}{1-4} = \frac{4(1-1024)}{-3} = 1364$

(43) $\frac{1}{4} - \frac{1}{6} + \frac{1}{9} - \frac{2}{27} + \cdots$

$r = \frac{-1/6}{1/4} = -\frac{4}{6} = -\frac{2}{3}$ $\quad S_\infty = \frac{a_1}{1-r}$

$S_\infty = \frac{1/4}{1-(-2/3)} = \frac{1/4}{5/3} = \frac{3}{20}$

(64)



Total Distance $= 10 + 2(7.5 + 5.625 + 4.21875 + \cdots)$

$S_\infty = \frac{7.5}{1-.75} = 30$

Total Distance $= 10 + 2(30)$

$= 70$ m

7.4 (1) $\frac{6!}{3!3!} = \frac{1\cdot2\cdot3\cdot4\cdot5\cdot6}{(1\cdot2\cdot3)(1\cdot2\cdot3)} = \frac{4\cdot5\cdot6}{6} = 20$

(41) Find the 6TH Term of $(4h - j)^8$

$\binom{8}{5}(4h)^3(-j)^5 = 56(64h^3)(-j^5) = -3584h^3j^5$

7.6 29a) $\underline{26}\cdot\underline{26}\cdot\underline{26}\cdot\underline{10}\cdot\underline{10}\cdot\underline{10}$ (Letters, Digits) $= 17,576,000$ Different License Plates

(35) 15 Club members, Choose a president, Vice-president, and secretary. How many ways can this be done? ${}_{15}P_3 = \frac{15!}{(15-3)!} = 13\cdot14\cdot15 = 2730$

(39) 40 members of association. 6 are randomly selected. How many ways can this be done?

${}_{40}C_6 = \frac{40!}{6!34!} = 3,838,380$