# Section 3.2: cont'd

Tuesday, October 28, 2014
8:35 AM

Assignment #4 due on

Monday, Nov 3

(online & hardcopy)

Test #2 on Monday, Nov 10

- covers sections 1.11
  1.12
  all of chapter 2
  " " " 3

(assigns 3 & 4)

- formula sheet on web

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arithmetic series:

$2 + 5 + 8 + \ldots$

notation: $S_n$ – sum of the first $n$ terms

calculate $S_8$:

$2 + 5 + 8 + 11 + 14 + 17 + 20 + 23 = 100$

the sum of each of these pairs is 25, and there are four of them

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$S_7 = 2 + 5 + 8 + 11 + 14 + 17 + 20$

$3\frac{1}{2}$ pairs summing to 22

so $S_n$ formula above works when $n$ is either even or odd

So:

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$$S_n = \frac{n}{2}(2a_1 + (n-1)d)$$

arithmetic series

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example: find the sum of the first 50 terms of

$2 + 5 + 8 + \dots$

$S_n = \frac{n}{2}(a_1 + a_n)$

$= \frac{50}{2}(2 + 149)$

$S_{50} = 3775$

$a_n = a_1 + (n-1)d$

$a_{50} = 2 + 49 \cdot 3$

$= 149$

example: evaluate

$$\sum_{k=4}^{50} (3k-3) = \underset{④}{(3\cdot 4-3)} + \underset{⑤}{(3\cdot 5-3)} + \underset{⑥}{(3\cdot 6-3)} + \dots + \underset{⑤⓪}{(3\cdot 50-3)}$$

$= 9 + 12 + 15 + \dots 147$

$S_n = \frac{n}{2}(a_1 + a_n)$

$= \frac{47}{2}(9 + 147)$

$S_{47} = 3666$

# terms = last − first + 1

$n = 50 - 4 + 1$

$= 47$