# PreCalculus Math 11

p. 27 # 1b, 2ab, 3ae, 4ad, 5a, 10, 11

1. a) $5+8+11+\ldots+53$

term formula: $t_n = t_1 + (n-1)d$

$53 = 5 + (n-1)3$

$53 = 5 + 3n - 3$

$53 = 2 + 3n$

$51 = 3n$

$17 = n$

$S_n = \frac{n}{2}(t_1 + t_n)$ ← sum formula 2

$S_{17} = \frac{17}{2}(5+53)$

$S_{17} = 8.5(58)$

$S_{17} = 493$

2. a) $1+3+5+\ldots \quad S_8$ $\quad t_1 = 1, d = 2$

$S_n = \frac{n}{2}[2t_1 + (n-1)d]$ ← sum formula 1

$S_8 = \frac{8}{2}[2(1) + (8-1)2]$

$S_8 = 4(2 + 7 \cdot 2)$

$S_8 = 4(2+14)$

$S_8 = 4(16)$

$S_8 = 64$

b) $40+35+30+\ldots \quad S_{11}$ $\quad t_1 = 40, d = -5$

$S_{11} = \frac{11}{2}[2(40) + (n-1)(-5)]$

$S_{11} = 5.5[80 + (11-1)(-5)]$

$S_{11} = 5.5[80 + (-50)]$

$S_{11} = 5.5(30)$

$S_{11} = 165$

3. a) $t_1 = 7, t_n = 79, n = 8$

$S_8 = \frac{8}{2}(7+79)$

$S_8 = 4(86)$

$S_8 = 344$

e) $t_1 = 42, d = -5, n = 14$

$S_{14} = \frac{14}{2}[2(42) + (14-1)(-5)]$

$S_{14} = 7[84 + (-65)]$

$S_{14} = 7(19)$

$S_{14} = 133$

p.27 cont.

4. a) $574 = \frac{14}{2}[2t_1 + (14-1)6]$

$574 = 7(2t_1 + 78)$

$574 = 14t_1 + 546$

$28 = 14t_1$

$2 = t_1$

d) $279 = \frac{18}{2}[2t_1 + (18-1)(-3)]$

$279 = 9[2t_1 + (-51)]$

$279 = 18t_1 - 459$

$738 = 18t_1$

$41 = t_1$

5. a) $608 = \frac{n}{2}(8+68)$ OR $608 = \frac{n}{2}(8+68)$

$608 = \frac{n}{2}(76)$ $608 = \frac{n}{2}(76)$

$608 = 38n$ $1216 = 76n$

$16 = n$ $16 = n$

10. $t_2 = 40 \rightarrow 40 = t_1 + (2-1)d$ $\quad 40 = t_1 + d$

$t_5 = 121 \rightarrow 121 = t_1 + (5-1)d$ $\quad 121 = t_1 + 4d$

use term formula

$40 = t_1 + d$

$121 = t_1 + 4d$

$-81 = -3d$

$27 = d$

subtract because the $t_1$ are the same sign

Find $t_1$: $40 = t_1 + 27$

$13 = t_1$

Sequence: 13, 40, 67, ...

$S_{25} = \frac{25}{2}[2(13) + (25-1)(27)]$

$S_{25} = 12.5(26 + 648)$

$S_{25} = 12.5(674)$

$S_{25} = 8425$

p.27 cont.

11. $S_5 = 85 \longrightarrow 85 = \frac{5}{2}[2t_1 + (5-1)d]$

$S_6 = 123 \longrightarrow 123 = \frac{6}{2}[2t_1 + (6-1)d]$

$85 = 2.5(2t_1 + 4d)$

$85 = 5t_1 + 10d$

$123 = 3(2t_1 + 5d)$

$123 = 6t_1 + 15d$

$85 = 5t_1 + 10d \rightarrow$ multiply by 3 $\rightarrow 255 = 15t_1 + 30d$

$123 = 6t_1 + 15d \rightarrow$ multiply by 2 $\rightarrow 246 = 12t_1 + 30d$

$9 = 3t_1$

$3 = t_1$

Find d $\rightarrow$ $85 = 5(3) + 10d$

$85 = 15 + 10d$

$70 = 10d$

$7 = d$

first 4 terms: 3, 10, 17, 24

Remember: Not all work will look exactly like this because there are numerous variations for these solutions.

Show your work, step by step, add a few words in and you should be okay