

# 9-4 Homework

1) a)  $4 + 7 + 10 + 13 + 16 + 19 + 22$

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

$$S_7 = \frac{7}{2}(4 + 22) = \frac{7}{2} \cdot 26 = \boxed{91}$$

b)  $10 + 20 + 30 + \dots + 110 + 120$

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

$$S_{12} = \frac{12}{2}(10 + 120) = 6 \cdot 130 = \boxed{780}$$

2) a)  $3 + 6 + 9 + 12 + 15 + 18 + 21$

$$\sum_{n=1}^7 3n$$

← symbol for  
summation  
notation

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

$$a_n = 3 + (n-1)3$$

$$a_n = \cancel{3} + 3n - \cancel{3}$$

$$a_n = 3n$$

3) sequence is a list  
series is the sum of all numbers!

1) Is it possible to have more than one arithmetic series with four terms whose sum is 44? Explain.

YES. examples:  $8 + 10 + 12 + 14 = 44$

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

$$2 + 8 + 14 + 20 = 44$$

$$44 = \frac{4}{2}(a_1 + a_n)$$

~~$$44 = \frac{4}{2}(a_1 + a_n)$$~~

$$44 = 2(a_1 + a_n)$$

$22 = (a_1 + a_n)$  First and last number should add up to 22

5)  $3 + 8 + 13 + \dots + 43$   $\sum_{n=3}^8 (3 + 5n)$  Wrong

Correction:

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

$$43 = 3 + (n-1) \cdot 5$$

$$43 = 3 + 5n - 5$$

$$43 = 5n - 2$$

$$5n = 45$$

$$\boxed{n=9}$$

there are 9 terms

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

$$a_n = 3 + (n-1) \cdot 5$$

$$a_n = 5n - 5 + 3$$

$$a_n = \boxed{5n - 2}$$

$$\sum_{n=1}^9 (5n - 2)$$

## 9-5 Homework

1) Evaluate

$$a) \frac{1}{5} + \frac{1}{10} + \frac{1}{20} + \frac{1}{40} + \frac{1}{80}$$

$$n=5 \quad r=\frac{1}{2} \quad a_1=\frac{1}{5} \quad S_n = \frac{a_1(1-r^n)}{1-r}$$

$$S_5 = \frac{\frac{1}{5} (1 - (\frac{1}{2})^5)}{1 - \frac{1}{2}}$$

$$S_5 = \frac{31}{80}$$

$$b) 9 - 6 + 4 - \frac{8}{3} + \frac{16}{9}$$

$$a_1=9 \quad r = \frac{-6}{9} = -\frac{2}{3} \quad n=5$$

$$S_n = \frac{a_1(1-r^n)}{1-r} = \frac{9(1 - (-\frac{2}{3})^5)}{1 - (-\frac{2}{3})} = \frac{55}{9}$$

don't do question 2, it's the same as question 1 in section 9-4 (by mistake)