

8-2 (Part 2) Arithmetic Means

The terms placed between 2 non-consecutive terms in an arithmetic sequence are called ARITHMETIC MEANS.

Ex. For the sequence : 5, 10, 15, 20



10 and 15 are the arithmetic means between 5 and 20.

- * It's helpful to think of the 2 given terms as the 1st and last terms in a smaller sequence.

Ex. Place 3 arithmetic means between -8 and 4.

- (1ST) Find range : Last - first
- * (2ND) Divide range by (number of terms in sequence - 1)
- (3RD) calculate / count means

$$4 - -8 = 12 \quad \text{this is } d$$

$$12 \div (4) = 3$$

$$\begin{array}{cccccc} 1 & 2 & 3 & 4 & 5 \\ -8, t_2, t_3, t_4, 4 \end{array}$$

$$-8 + 3 = -5$$

$$-5 + 3 = -2$$

$$-2 + 3 = 1$$

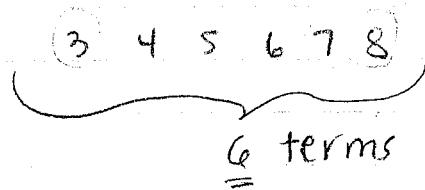
Ex. The 3rd + 8th terms of an Ar. Seq. are 10 and -20.

a) use ar. means to find the 5th term

$$-20 - 10 = -30$$

$$-30 \div (6-1)$$

$$-30 \div 5 = -6 \leftarrow d$$



$$4^{\text{th}} \text{ term: } 10 + (-6) = 4$$

$$5^{\text{th}} \text{ term: } 4 + (-6) = -2$$

b) state a and d.

a: first term: 3rd 10

2nd 16

1st 22 = a

$$d = -6$$

c) state the general formula for this sequence, t_n

$$t_n = a + (n-1)d$$

$$t_n = 22 + (n-1)-6$$

$$t_n = 22 - 6n + 6$$

$$t_n = 28 - 6n$$

$$d = \frac{t_p - t_q}{p - q}$$