Bellwork Alg 2 Tuesday, September 17, 2019

1. The sum of the first 13 terms of an Arithmetic Series is 663.

a. If the last term is 93, find the first term.

b. Find the common difference.

2. The sum of the first nine terms of a Geometric Series is 137774. If the common ratio is 3, find the first term.

3. The sum of the first 12 terms of an Arithmetic Series is −363. If the first term is −8 and the last term is −58, find the ~~common difference~~.

n

# of terms.

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ANSWERS

1. The sum of the first 13 terms of an Arithmetic Series is 663.

a. If the last term is 93, find the first term.

sum FORMULA: $S_n = \frac{n}{2}(t_1 + t_n)$

$663 = \frac{13}{2}(t_1 + 93)$

$\frac{663}{6.5} = \frac{6.5(t_1 + 93)}{6.5}$

$102 = t_1 + 93$

$-93 \quad -93$

$\boxed{t_1 = 9}$

b. Find the common difference.

EXPLICIT FORMULA

$t_1 = 9$

$t_n = t_{13} = 93$

$n = 13$

$t_n = t_1 + d(n-1)$

$93 = 9 + d(13-1)$

$93 = 9 + 12d$

$-9 \quad -9$

$\frac{84}{12} = \frac{12d}{12}$

$\boxed{d = 7}$

2. The sum of the first nine terms of a Geometric Series is 137774. If the common ratio is 3, find the first term.

sum formula:

$S_n = t_1\left(\frac{1-r^n}{1-r}\right)$

$S_n = 137774$

$r = 3$

$n = 9$

$137774 = t_1\left(\frac{1-3^9}{1-3}\right)$

$\frac{137774}{9841} = \frac{t_1 \cdot 9841}{9841}$

$\boxed{t_1 = 14}$

3. The sum of the first n terms of an Arithmetic Series is –363. If the first term is –8 and the last term is –58, find the ~~common difference~~ # of terms.

Sum Formula:

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

$-363 = \frac{n}{2}(-8 + -58)$

$\frac{-363}{-66} = \frac{\frac{n}{2}(-66)}{-66}$

$2 \cdot 5.5 = \frac{n}{2} \cdot 2$

$\boxed{n = 11}$