(23) Given arithmetic series and S_n, find n.

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

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

$$S_n = \frac{n}{2}(t_1 + t_1 + d(n-1))$$

(23) $S_n = 4407$

$t_1 = 32$

$d = 11$

$$4407 = \frac{n}{2}(32 + 32 + 11(n-1))$$

$$8814 = n(53 + 11n)$$

$$0 = 11n^2 + 53n - 8814$$

$$\frac{-53 \pm \sqrt{53^2 - 4(11)(-8814)}}{22}.$$

$n = 26, \cancel{-30.82}$

Arithmetic seq & series

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

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

Geometeric seq & series

$$t_n = t_1 \cdot r^{n-1}$$

$$S_n = t_1 \frac{1-r^n}{1-r}$$