

1) 9th term is 79; 17th term is 115. Find the sum of the first 20 terms of this Arithmetic series.

$$\frac{(115-79)}{(17-9)} = 4.5 = d$$

$$a_n = a + d(n-1), a_9 = a + d(9-1), 79 = a + 4.5 * (9-1), 43 = a$$

$$a_{20} = 43 + 4.5(20-1) = 128.5$$

$$S_n = \frac{n}{2}(a + a_n) = S_{20} = \frac{20}{2}(43 + 128.5) = 1715$$

Find the sum of the following series:

2) -28-36-44- ... -132

$$a=-28, d=-8$$

$$a_n = a + d(n-1), -132 = -28 - 8(n-1), n = 14$$

$$S_n = \frac{n}{2}(a + a_n), S_{14} = \frac{14}{2}(-28 - 132) = -1,120$$

$$3) \frac{2}{7} + \frac{10}{49} + \frac{50}{343} + \dots + \frac{6250}{117649}$$

$$a = \frac{2}{7}, d = \frac{\left(\frac{10}{49}\right) - \left(\frac{2}{7}\right)}{\left(\frac{2}{7}\right)} = \frac{5}{7}$$

$$a_n = a * r^{(n-1)} = \frac{2}{7} * \left(\frac{5}{7}\right)^{(n-1)}, \frac{6250}{117649} = \frac{2}{7} * \left(\frac{5}{7}\right)^{(n-1)}, \frac{\ln\left(\frac{6250}{117649} * \frac{7}{2}\right)}{\ln\left(\frac{5}{7}\right)} = n - 1, n = 6$$

$$S_n = a \left(\frac{1-r^n}{1-r}\right), S_6 = \frac{2}{7} * \left(\frac{1-\left(\frac{5}{7}\right)^6}{1-\frac{5}{7}}\right) = 0.867190$$

$$4) \sum_{k=1}^{\infty} -4\left(\frac{11}{15}\right)^{k-1}$$

$$S = \frac{a}{1-r} = \frac{-4}{1-\frac{11}{15}} = -15$$