Determine the 10th number in the sequence and the sum from the first number to the 10th number for each of the following series.

1, 2, 3, 4, ... arithmetic series

$a_1 = 1$

$n = 10$

$k = 4 - 3 = 1$

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

$= 1 + (10-1)(1)$

$\boxed{a_n = 10}$

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

$= \frac{(10)(1+10)}{2}$

$\boxed{S_n = 55}$

2, 4, 8, 16, ... geometric series

$a_1 = 2$

$n = 10$

$r = \frac{16}{8} = 2$

$a_n = a_1 r^{n-1}$

$= (2)(2^{10-1})$

$\boxed{a_n = 1024}$

$S_n = a_1 \frac{1 - r^n}{1 - r}$

$= (2)\frac{1 - 2^{10}}{1 - 2}$

$\boxed{S_n = 2046}$

1, 0.5, 0, ... arithmetic series

$a_1 = 1$

$n = 10$

$k = 0 - 0.5 = -0.5$

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

$= 1 + (10-1)(-0.5)$

$\boxed{a_n = -3.5}$

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

$= \frac{(10)(1 - 3.5)}{2}$

$\boxed{S_n = -12.5}$

3, -0.3, 0.03, ... geometric series

$a_1 = 3$

$n = 10$

$r = \frac{0.03}{-0.3} = -0.1$

$a_n = a_1 r^{n-1}$

$= (3)(-0.1)^{10-1}$

$\boxed{a_n = -3 \times 10^{-9}}$

$S_n = a_1 \frac{1-r^n}{1-r}$

$= (3)\frac{1-(-0.1)^{10}}{1-(-0.1)}$

$\boxed{S_n \cong 2.72}$

$1, \frac{1}{2}, \frac{1}{4}, \ldots$ geometric series

$a_1 = 1$

$n = 10$

$r = \frac{1/4}{1/2} = 0.5$

$a_n = a_1 r^{n-1}$

$= (1)(0.5)^{10-1}$

$\boxed{a_n \cong 1.95 \times 10^{-3}}$

$S_n = a_1 \frac{1-r^n}{1-r}$

$= (1)\frac{1-0.5^{10}}{1-0.5}$

$\boxed{S_n \cong 1.9980}$

$1, \frac{1}{10}, \frac{1}{100}, \ldots$ geometric series

$a_1 = 1$

$n = 10$

$r = \frac{1/100}{1/10} = 0.1$

$a_n = a_1 r^{n-1}$

$= (1)(0.1)^{10-1}$

$\boxed{a_n = 1 \times 10^{-9}}$

$S_n = a_1 \frac{1-r^n}{1-r}$

$= (1)\frac{1-0.1^{10}}{1-0.1}$

$\boxed{S_n \cong 1.11111}$