Geometric Series

Formula for a Geometric Series

$$S_n = \frac{a_1\left(1 - r^n\right)}{1 - r}$$

Find the sum of : $\frac{2}{5}+\frac{1}{10}+\frac{1}{40}+\frac{1}{160}+\frac{1}{640}$

Find S_5 of the series: 1 + 4 + 16...

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

$a_1 = 1$
$r = 4$
$n = 5$

$S_5 = \frac{1(1-4^5)}{1-4}$

$S_5 = 341$

Find S_8 of the series: 7 + 21 + 63 + …

$$\frac{7(1-3^8)}{1-3}$$

$$= 32{,}960$$

Find S_6 of the series: $\frac{1}{9} - \frac{1}{3} + 1 + \cdots$

Round to the nearest hundredth, if necessary…

$$\sum_{n=1}^{4} 4\left(2^{n-1}\right)$$

$a_1 = 4$ $r = 2$ $n = 4$

$$S_4 = \frac{4(1-2^4)}{1-2}$$

$$S_4 = 60$$

Round to the nearest hundredth, if necessary…

$$\sum_{n=1}^{12}\left(3.1^{n-1}\right)$$

$a_1 \cdot r^{n-1}$

(3.1^{n-1})

understood to be 1

$a_1 = 1$
$r = 3.1$ $n = 12$

$$\frac{1\left(1-3.1^{12}\right)}{1-3.1}$$

375,077.0399

Round to the nearest hundredth, if necessary…

$$\sum_{n=1}^{17} \frac{2}{3}\left(3^{n-1}\right)$$

$$\frac{2\left(1-(-3)^4\right)}{1-(-3)}$$

$$= -40$$

$a_1 = 2$
$r = -3$
$n = 4$