

GEOMETRIC SERIES 4-9-15

A Geometric Series is formed when the terms of a geometric sequence are added together.

$2+4+8+16+32+64$
 $\checkmark \checkmark$
 $\times 2$
 $r=2$

$S_6 = 2 \left(\frac{1-2^6}{1-2} \right)$
 $S_n = a_1 \left(\frac{1-r^n}{1-r} \right)$ 126

Apr 1-10:13 AM

17, 18

⑰ $y = 4x - \frac{3}{4}$
 $x = 4y - \frac{3}{4}$
 $\begin{matrix} +\frac{3}{4} \\ +\frac{3}{4} \end{matrix}$
 $\frac{1}{4}(x + \frac{3}{4}) = 4y - \frac{1}{4}$
 $\frac{1}{4}x + \frac{3}{16} = 4y - \frac{1}{4}$

⑱ $y = \frac{(x-3)^3}{5}$
 $5x = \frac{(y-3)^3}{8}$
 $\sqrt[3]{5x} = \sqrt[3]{\frac{(y-3)^3}{8}}$
 $\sqrt[3]{5x} = \frac{y-3}{2}$
 $\sqrt[3]{5x} + 3 = \frac{y-3}{2} + 3 = f^{-1}(x)$

Apr 9-9:24 AM

You can continue the pattern then add or use the formula.

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

Ex. 1 - Find S_9 for the series 5, 15, 45, 135, 405, 1215, 3645, 10935, 32805
 $S = 5 \left(\frac{1-3^9}{1-3} \right) = 49205$

Ex. 2 - Find S_8 for the series 1, -5, 25, -125, 625 ...

Ex. 3 - Find S_{10} for the series 80, 40, 20, 10, 5, 2.5, 1.25, 0.625, 0.3125, 0.15625
 $\frac{40}{80} = \frac{1}{2}$ $\frac{20}{40} = \frac{1}{2}$
 $S = 80 \left(\frac{1 - (\frac{1}{2})^{10}}{1 - \frac{1}{2}} \right) = 159.84$

Apr 3-1:22 PM

Conclusion

1. What does S_n mean in a geometric series? *Sum of the sequence*
2. What must you do first when finding the sum if you do not know the last number in the sequence?
3. Questions???

Keep mult or
 $a_n = a_1 r^{n-1}$

Apr 3-1:09 PM

Assignment:
Geometric Series WS

Apr 3-1:09 PM