

1. Re-write each series below using  $\Sigma$ -notation.

(a)  $1 - \frac{1}{4} + \frac{1}{7} - \frac{1}{10} + \frac{1}{13} - \dots$

(b)  $\frac{1}{10} + \frac{4}{100} + \frac{9}{1000} + \frac{16}{10000} + \dots$

(c)  $\frac{2}{3!} - \frac{4}{4!} + \frac{8}{5!} - \frac{16}{6!} + \frac{32}{7!} - \dots$

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2. Write  $0.\overline{54} = 0.545454\dots$  as a geometric series and as a reduced fraction.

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3. Calculate the following sums.

(a)  $\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} + \dots$

(b)  $1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \frac{1}{16} - \dots$

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4. Calculate the following sums.

(a)  $5 + 0.5 + 0.05 + 0.005 + 0.0005 + \dots$

(b)  $0.1 - 0.01 + 0.001 - 0.0001 + \dots$

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5. Find the sum of each geometric series below.

(a)  $\sum_{k=0}^{\infty} \frac{2^{k+2}}{3^k}$ .

(b)  $\sum_{k=1}^{\infty} \frac{(-1)^k}{5^k}$ .

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6. Find the sum of each geometric series below.

(a)  $1 - 2x + 4x^2 - 8x^3 + 16x^4 - \dots$

(b)  $1 + \sin x + \sin^2 x + \sin^3 x + \sin^4 x + \dots$

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