Show All Solutions

Rosen, Discrete Mathematics and Its Applications, 6th edition
Extra Examples

Section 2.4—Sequences and Summations

Extra Examples — *Page references correspond to locations of Extra Examples icons in the textbook.*

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p.152, icon at Example 5

#1. Find a rule that produces a sequence $a_1, a_2, a_3, \ldots$ with the first terms $5, 7, 9, 11, 13, \ldots$.

See Solution

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p.152, icon at Example 5

#2. Find a formula for an infinite sequence $a_1, a_2, a_3, \ldots$ that begins with the terms $1/3, 1/4, 1/5, 1/6, \ldots$.

See Solution

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p.152, icon at Example 5

#3. Find a formula for an infinite sequence $a_1, a_2, a_3, \ldots$ that begins with the terms $7, 11, 15, 19, 23, \ldots$.

See Solution

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p.152, icon at Example 5

#4. Find a formula for an infinite sequence $a_1, a_2, a_3, \ldots$ that begins with the terms $1, 2, 1, 2, 1, 2, 1$ and continues this alternating pattern.

See Solution

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p.152, icon at Example 5

#5. Find a formula for an infinite sequence $a_1, a_2, a_3, \ldots$ that begins with the terms $0, 2, 6, 12, 20, 30, 42, \ldots$.

See Solution

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p.152, icon at Example 5

#6. Find a rule that produces a sequence $a_1, a_2, a_3, \ldots$ with the first terms $3, 6, 12, 24, 48, \ldots$.

See Solution

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p.152, icon at Example 5

#7. Find a rule that produces a sequence $a_1, a_2, a_3, \ldots$ with the first terms $1, 1, 2, 2, 3, 3, 4, 4, 5, 5, 6, 6, \ldots$.

See Solution

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p.154, icon at Example 9

#1. Express in sigma notation the sum of the first 50 terms of the series $4 + 4 + 4 + 4 + 4 + \ldots$.

See Solution

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p.154, icon at Example 9

#2. Find the value of each of these sums

(a) $\sum_{j=1}^{4}(j^2-1)$.

(b) $\sum_{k=1}^{4}(k^2-1)$.

(c) $\sum_{j=1}^{4}(k^2-1)$.

See Solution

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p.154, icon at Example 9

#3. Find the value of each of these sums:

(a) $\sum_{k=1}^{4}(k^2-1)$.

(b) $\sum_{k=1}^{4}k^2-1$.

See Solution

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p.155, icon at Example 12

#1. Express in sigma notation the sum of the first 50 terms of the series $3 + 6 + 9 + 12 + 15 + \ldots$.

See Solution

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p.155, icon at Example 12

#2. The following is a geometric series: $\sum_{i=0}^{10} 2^i$. Identify a, r, and n, and then find the sum of the series.

See Solution

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p.155, icon at Example 12

#3. The following is a geometric series: $4 + 2 + 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \cdots + \frac{1}{64}$. Identify a, r, and n, and then find the sum of the series.

See Solution

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p.155, icon at Example 12

#4. Find the sum of the series $2^4 + 2^5 + 2^6 + \cdots + 2^{17}$.

See Solution

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p.157, icon at Example 16

#1. Find $1 + x^2 + x^4 + x^6 + x^8 + \cdots$ assuming $|x| < 1$.

See Solution

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p.157, icon at Example 16

#2. Prove that $\displaystyle\sum_{i=1}^{\infty} \frac{1}{4^i} = 2 \sum_{i=1}^{\infty} \frac{1}{7^i}$.

See Solution

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p.157, icon at Example 16

#3. Find the sum of each of these infinite series:

(a) $\displaystyle\sum_{i=1}^{\infty} \frac{1}{2^i}$.

(b) $\displaystyle\sum_{i=1}^{\infty} (-1)^i \frac{1}{2^i}$.

See Solution

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p.160, icon at Example 21

#1. We know that the set of rational numbers is countable. Are the irrational numbers (the real numbers that cannot be written as fractions a/b where a and b are integers and $b \neq 0$) also countable, or are they uncountable?

See Solution

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p.160, icon at Example 21

#2. Show that the set $\{x \mid 0 < x < 1\}$ is uncountable by showing that there is a one-to-one correspondence between this set and the set of all real numbers.

See Solution
