Sequences, Mathematical Induction, and Recursion · Partner Check 1

A

Name: _____ Partner's name: _____ Date: _____

Directions: Work alone on your own problems. Partner B has different problems with the same answers. After each problem, compare answers; if they differ, find the mistake together.
Answer conventions: sets in roster form with elements in increasing order, ∅ for the empty set; truth columns as T/F strings in standard row order (TT, TF, FT, FF; with r: TTT, TTF, …, FFF); fractions in lowest terms; ordered pairs as (x, y).

1

Evaluate 7!/6!.

Answer: _____ Match? ☐ Yes ☐ No

2

Evaluate C(4, 2).

Answer: _____ Match? ☐ Yes ☐ No

3

Arithmetic sequence: $a_1 = -3$, $d = 3$. Find a_7.

Answer: _____ Match? ☐ Yes ☐ No

4

$a_0 = 3$, $a_n = 2a_{n-1} + 1$. Find a_5.

Answer: _____ Match? ☐ Yes ☐ No

5

Evaluate $1 + 2 + \ldots + 12$.

Answer: _____ Match? ☐ Yes ☐ No

6

Arithmetic sequence: $a_1 = 8$, $d = 6$. Find a_{10}.

Answer: _____ Match? ☐ Yes ☐ No

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B

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Directions: Work alone on your own problems. Partner A has different problems with the same answers. After each problem, compare answers; if they differ, find the mistake together.
Answer conventions: sets in roster form with elements in increasing order, ∅ for the empty set; truth columns as T/F strings in standard row order (TT, TF, FT, FF; with r: TTT, TTF, …, FFF); fractions in lowest terms; ordered pairs as (x, y).

1

How many ways can 1 different medals be given to 1 of 7 runners?

Answer: _____ Match? ☐ Yes ☐ No

2

How many 2-element subsets does a 4-element set have?

Answer: _____ Match? ☐ Yes ☐ No

3

$a_1 = 0$ and $a_n = a_{n-1} + 3$. Find a_6.

Answer: _____ Match? ☐ Yes ☐ No

4

How many moves does the Tower of Hanoi need for 7 disks ($m_k = 2m_{k-1} + 1$, $m_1 = 1$)?

Answer: _____ Match? ☐ Yes ☐ No

5

Evaluate $\Sigma_{k=1}^{12} k$.

Answer: _____ Match? ☐ Yes ☐ No

6

$a_1 = 2$ and $a_n = a_{n-1} + 6$. Find a_{11}.

Answer: _____ Match? ☐ Yes ☐ No

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1

Evaluate 1 + 2 + ... + 13.

Answer: _____ Match? ☐ Yes ☐ No

2

Arithmetic sequence: $a_1 = -2$, $d = 4$. Find a_16.

Answer: _____ Match? ☐ Yes ☐ No

3

Evaluate C(4, 2).

Answer: _____ Match? ☐ Yes ☐ No

4

Arithmetic sequence: $a_1 = -3$, $d = 4$. Find a_13.

Answer: _____ Match? ☐ Yes ☐ No

5

Evaluate 7!/6!.

Answer: _____ Match? ☐ Yes ☐ No

6

$a_0 = 3$, a_n = 2a_(n−1) + 1. Find a_4.

Answer: _____ Match? ☐ Yes ☐ No

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B

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Answer conventions: sets in roster form with elements in increasing order, ∅ for the empty set; truth columns as T/F strings in standard row order (TT, TF, FT, FF; with r: TTT, TTF, …, FFF); fractions in lowest terms; ordered pairs as (x, y).

1

Evaluate Σ_{k=1}^{13} k.

Answer: _____ Match? ☐ Yes ☐ No

2

$a_1 = 2$ and $a_n = a_{n-1} + 4$. Find a_{15}.

Answer: _____ Match? ☐ Yes ☐ No

3

How many 2-element subsets does a 4-element set have?

Answer: _____ Match? ☐ Yes ☐ No

4

$a_1 = 9$ and $a_n = a_{n-1} + 4$. Find a_{10}.

Answer: _____ Match? ☐ Yes ☐ No

5

How many ways can 1 different medals be given to 1 of 7 runners?

Answer: _____ Match? ☐ Yes ☐ No

6

How many moves does the Tower of Hanoi need for 6 disks ($m_k = 2m_{k-1} + 1$, $m_1 = 1$)?

Answer: _____ Match? ☐ Yes ☐ No

A

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1

Evaluate 5!/3!.

Answer: _____ Match? ☐ Yes ☐ No

2

Arithmetic sequence: $a_1 = -2$, $d = 2$. Find a_16.

Answer: _____ Match? ☐ Yes ☐ No

3

Evaluate C(7, 2).

Answer: _____ Match? ☐ Yes ☐ No

4

Arithmetic sequence: $a_1 = -1$, $d = 2$. Find a_15.

Answer: _____ Match? ☐ Yes ☐ No

5

Evaluate 1 + 2 + ... + 18.

Answer: _____ Match? ☐ Yes ☐ No

6

$a_0 = 3$, a_n = 2a_(n−1) + 1. Find a_5.

Answer: _____ Match? ☐ Yes ☐ No

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B

Name: _____ Partner's name: _____ Date: _____

Directions: Work alone on your own problems. Partner A has different problems with the same answers. After each problem, compare answers; if they differ, find the mistake together.
Answer conventions: sets in roster form with elements in increasing order, ∅ for the empty set; truth columns as T/F strings in standard row order (TT, TF, FT, FF; with r: TTT, TTF, …, FFF); fractions in lowest terms; ordered pairs as (x, y).

1

How many ways can 2 different medals be given to 2 of 5 runners?

Answer: _____ Match? ☐ Yes ☐ No

2

$a_1 = 0$ and $a_n = a_{n-1} + 2$. Find a_{15}.

Answer: _____ Match? ☐ Yes ☐ No

3

How many 2-element subsets does a 7-element set have?

Answer: _____ Match? ☐ Yes ☐ No

4

$a_1 = -3$ and $a_n = a_{n-1} + 2$. Find a_{16}.

Answer: _____ Match? ☐ Yes ☐ No

5

Evaluate $\Sigma_{k=1}^{18} k$.

Answer: _____ Match? ☐ Yes ☐ No

6

How many moves does the Tower of Hanoi need for 7 disks ($m_k = 2m_{k-1} + 1$, $m_1 = 1$)?

Answer: _____ Match? ☐ Yes ☐ No