Sequences, Induction, and the Binomial Theorem

Arithmetic and geometric sequences, proof by induction, and binomial expansion.

Completion Reward

Shown here as a small pack artifact, not a preview destination.

Name ________________________ Date ____________________

32 main | 2-up grid | 11 pages | visible side quests

1. Which sequence is arithmetic?

A. 2, 4, 8, 16, ...
B. 1, 1, 2, 3, ...
C. 3, 7, 11, 15, ...
D. 5, 9, 12, 14, ...

1.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

1.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

1.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

1.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

1.5. For $a_n = 4 + 2(n - 1)$, what is a_5?

A. 10
B. 12
C. 14
D. 16

2. Which sequence is geometric?

A. 2, 5, 8, 11, ...
B. 2, 6, 18, 54, ...
C. 1, 4, 9, 16, ...
D. 3, 5, 7, 11, ...

2.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

2.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

2.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

2.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

2.5. For $a_n = 4 + 2(n - 1)$, what is a_5?

A. 10
B. 12
C. 14
D. 16

3. What is the purpose of mathematical induction?

A. To prove a statement is true for every positive integer in a sequence of cases
B. To guess the next term in a pattern from a graph
C. To estimate a derivative numerically
D. To turn any recursive formula into an explicit one automatically

3.1. The goal of mathematical induction is to prove a statement for:

A. one value only
B. all integers in a pattern
C. only negative numbers
D. only even numbers

3.2. After proving the base case, what comes next in induction?

A. assume the statement for k and prove it for k + 1
B. graph the sequence
C. differentiate both sides
D. set n = 0 again

3.3. Binomial coefficients in $(a + b)^n$ count:

A. powers of a only
B. how terms combine in the expansion
C. zeros of the polynomial
D. slopes of a graph

3.4. Pascal's triangle is useful for:

A. graphing logarithms
B. reading binomial coefficients
C. solving inequalities
D. finding asymptotes

3.5. A binomial coefficient like C(5, 2) counts:

A. ordered arrangements
B. ways to choose 2 objects from 5
C. the square of 5
D. the slope of a line

4. Where do the coefficients in a binomial expansion come from?

A. Pascal's triangle or combinations
B. Only the quadratic formula
C. The unit circle
D. Repeated subtraction of exponents

4.1. The goal of mathematical induction is to prove a statement for:

A. one value only
B. all integers in a pattern
C. only negative numbers
D. only even numbers

4.2. After proving the base case, what comes next in induction?

A. assume the statement for k and prove it for k + 1
B. graph the sequence
C. differentiate both sides
D. set n = 0 again

4.3. Binomial coefficients in (a + b)^n count:

A. powers of a only
B. how terms combine in the expansion
C. zeros of the polynomial
D. slopes of a graph

4.4. Pascal's triangle is useful for:

A. graphing logarithms
B. reading binomial coefficients
C. solving inequalities
D. finding asymptotes

4.5. A binomial coefficient like C(5, 2) counts:

A. ordered arrangements
B. ways to choose 2 objects from 5
C. the square of 5
D. the slope of a line

5. What does a recursive formula do?

A. Defines a term using earlier terms
B. Gives every term directly from n only
C. Always creates a geometric sequence
D. Never needs a first term

5.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

5.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

5.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

5.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

5.5. For a_n = 4 + 2(n - 1), what is a_5?

A. 10
B. 12
C. 14
D. 16

6. Which formula is an explicit form for an arithmetic sequence?

A. a_n = a_1r^n
B. a_n = a_1 + (n - 1)d
C. a_n = n!
D. a_n = 2^n + 1 always

6.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

6.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

6.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

6.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

6.5. For a_n = 4 + 2(n - 1), what is a_5?

A. 10
B. 12
C. 14
D. 16

7. Which formula is an explicit form for a geometric sequence?

A. a_n = a_1 + (n - 1)d
B. a_n = n + 1
C. a_n = n^2
D. a_n = a_1r^(n - 1)

7.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

7.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

7.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

7.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

7.5. For a_n = 4 + 2(n - 1), what is a_5?

A. 10
B. 12
C. 14
D. 16

8. What does 5! mean?

A. 5 + 4 + 3 + 2 + 1
B. 5^5
C. 5 x 5
D. 5 x 4 x 3 x 2 x 1

8.1. What is the next term in 7, 11, 15, 19, ...?

A. 21
B. 22
C. 23
D. 24

8.2. What is the next term in 3, 9, 27, ...?

A. 30
B. 54
C. 81
D. 243

8.3. A recursive formula tells you:

A. every term directly from n only
B. how to get each term from earlier term(s)
C. the graph of a function
D. the area of a figure

8.4. The coefficient of x^2 in (x + 1)^2 is:

A. 1
B. 2
C. 3
D. 4

8.5. In proof by induction, after checking the base case, you usually:

A. assume the statement is true for k
B. set n = 0 forever
C. draw a graph
D. differentiate both sides

9. After checking the base case in an induction proof, what comes next?

A. Assume the statement for n and prove it for n + 1
B. Check a second random value of n and stop
C. Expand the statement with the binomial theorem
D. Take the derivative of both sides

9.1. The goal of mathematical induction is to prove a statement for:

A. one value only
B. all integers in a pattern
C. only negative numbers
D. only even numbers

9.2. After proving the base case, what comes next in induction?

A. assume the statement for k and prove it for k + 1
B. graph the sequence
C. differentiate both sides
D. set n = 0 again

9.3. Binomial coefficients in (a + b)^n count:

A. powers of a only
B. how terms combine in the expansion
C. zeros of the polynomial
D. slopes of a graph

9.4. Pascal's triangle is useful for:

A. graphing logarithms
B. reading binomial coefficients
C. solving inequalities
D. finding asymptotes

9.5. A binomial coefficient like C(5, 2) counts:

A. ordered arrangements
B. ways to choose 2 objects from 5
C. the square of 5
D. the slope of a line

10. To decide whether a sequence is geometric, what should you examine?

A. Only the first term
B. The sum of the first and last terms
C. The derivative
D. The ratio between consecutive terms

10.1. What is the next term in 7, 11, 15, 19, ...?

A. 21
B. 22
C. 23
D. 24

10.2. What is the next term in 3, 9, 27, ...?

A. 30
B. 54
C. 81
D. 243

10.3. A recursive formula tells you:

A. every term directly from n only
B. how to get each term from earlier term(s)
C. the graph of a function
D. the area of a figure

10.4. The coefficient of x^2 in (x + 1)^2 is:

A. 1
B. 2
C. 3
D. 4

10.5. In proof by induction, after checking the base case, you usually:

A. assume the statement is true for k
B. set n = 0 forever
C. draw a graph
D. differentiate both sides

11. A student says 2, 6, 18, 54 is arithmetic because it keeps getting bigger. What is wrong?

A. The sequence is decreasing
B. Arithmetic sequences can never be positive
C. Nothing is wrong
D. Arithmetic requires a constant difference, not just growth

11.1. What is the next term in 7, 11, 15, 19, ...?

A. 21
B. 22
C. 23
D. 24

11.2. What is the next term in 3, 9, 27, ...?

A. 30
B. 54
C. 81
D. 243

11.3. A recursive formula tells you:

A. every term directly from n only
B. how to get each term from earlier term(s)
C. the graph of a function
D. the area of a figure

11.4. The coefficient of x^2 in (x + 1)^2 is:

A. 1
B. 2
C. 3
D. 4

11.5. In proof by induction, after checking the base case, you usually:

A. assume the statement is true for k
B. set n = 0 forever
C. draw a graph
D. differentiate both sides

12. A student expands (x + y)^2 as x^2 + y^2. What is missing?

A. A constant 1
B. A denominator
C. Nothing is missing
D. The middle term 2xy

12.1. What is the next term in 7, 11, 15, 19, ...?

A. 21
B. 22
C. 23
D. 24

12.2. What is the next term in 3, 9, 27, ...?

A. 30
B. 54
C. 81
D. 243

12.3. A recursive formula tells you:

A. every term directly from n only
B. how to get each term from earlier term(s)
C. the graph of a function
D. the area of a figure

12.4. The coefficient of x^2 in (x + 1)^2 is:

A. 1
B. 2
C. 3
D. 4

12.5. In proof by induction, after checking the base case, you usually:

A. assume the statement is true for k
B. set n = 0 forever
C. draw a graph
D. differentiate both sides

13. Find the next term of 4, 9, 14, 19, ... Answer with a number.

13.1. What is the next term in 7, 11, 15, 19, ...?

A. 21
B. 22
C. 23
D. 24

13.2. What is the next term in 3, 9, 27, ...?

A. 30
B. 54
C. 81
D. 243

13.3. A recursive formula tells you:

A. every term directly from n only
B. how to get each term from earlier term(s)
C. the graph of a function
D. the area of a figure

13.4. The coefficient of x^2 in (x + 1)^2 is:

A. 1
B. 2
C. 3
D. 4

13.5. In proof by induction, after checking the base case, you usually:

A. assume the statement is true for k
B. set n = 0 forever
C. draw a graph
D. differentiate both sides

14. Find the next term of 2, 10, 50, 250, ... Answer with a number.

14.1. What is the next term in 7, 11, 15, 19, ...?

A. 21
B. 22
C. 23
D. 24

14.2. What is the next term in 3, 9, 27, ...?

A. 30
B. 54
C. 81
D. 243

14.3. A recursive formula tells you:

A. every term directly from n only
B. how to get each term from earlier term(s)
C. the graph of a function
D. the area of a figure

14.4. The coefficient of x^2 in (x + 1)^2 is:

A. 1
B. 2
C. 3
D. 4

14.5. In proof by induction, after checking the base case, you usually:

A. assume the statement is true for k
B. set n = 0 forever
C. draw a graph
D. differentiate both sides

15. For the arithmetic sequence with a1 = 7 and d = 4, find a5. Answer with a number.

15.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

15.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

15.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

15.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

15.5. For a_n = 4 + 2(n - 1), what is a_5?

A. 10
B. 12
C. 14
D. 16

16. For the geometric sequence with a1 = 3 and r = 2, find a5. Answer with a number.

16.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

16.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

16.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

16.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

16.5. For a_n = 4 + 2(n - 1), what is a_5?

A. 10
B. 12
C. 14
D. 16

17. Compute 6!. Answer with a number.

17.1. What is the next term in 7, 11, 15, 19, ...?

A. 21
B. 22
C. 23
D. 24

17.2. What is the next term in 3, 9, 27, ...?

A. 30
B. 54
C. 81
D. 243

17.3. A recursive formula tells you:

A. every term directly from n only
B. how to get each term from earlier term(s)
C. the graph of a function
D. the area of a figure

17.4. The coefficient of x^2 in (x + 1)^2 is:

A. 1
B. 2
C. 3
D. 4

17.5. In proof by induction, after checking the base case, you usually:

A. assume the statement is true for k
B. set n = 0 forever
C. draw a graph
D. differentiate both sides

18. What is the coefficient of x^2y in (x + y)^3? Answer with a number.

18.1. The goal of mathematical induction is to prove a statement for:

A. one value only
B. all integers in a pattern
C. only negative numbers
D. only even numbers

18.2. After proving the base case, what comes next in induction?

A. assume the statement for k and prove it for k + 1
B. graph the sequence
C. differentiate both sides
D. set n = 0 again

18.3. Binomial coefficients in (a + b)^n count:

A. powers of a only
B. how terms combine in the expansion
C. zeros of the polynomial
D. slopes of a graph

18.4. Pascal's triangle is useful for:

A. graphing logarithms
B. reading binomial coefficients
C. solving inequalities
D. finding asymptotes

18.5. A binomial coefficient like C(5, 2) counts:

A. ordered arrangements
B. ways to choose 2 objects from 5
C. the square of 5
D. the slope of a line

19. What is the coefficient of x^2 in (x + 1)^4? Answer with a number.

19.1. The goal of mathematical induction is to prove a statement for:

A. one value only
B. all integers in a pattern
C. only negative numbers
D. only even numbers

19.2. After proving the base case, what comes next in induction?

A. assume the statement for k and prove it for k + 1
B. graph the sequence
C. differentiate both sides
D. set n = 0 again

19.3. Binomial coefficients in (a + b)^n count:

A. powers of a only
B. how terms combine in the expansion
C. zeros of the polynomial
D. slopes of a graph

19.4. Pascal's triangle is useful for:

A. graphing logarithms
B. reading binomial coefficients
C. solving inequalities
D. finding asymptotes

19.5. A binomial coefficient like C(5, 2) counts:

A. ordered arrangements
B. ways to choose 2 objects from 5
C. the square of 5
D. the slope of a line

20. Find the sum of the first 5 terms of 2, 5, 8, 11, 14. Answer with a number.

20.1. What is the next term in 7, 11, 15, 19, ...?

A. 21
B. 22
C. 23
D. 24

20.2. What is the next term in 3, 9, 27, ...?

A. 30
B. 54
C. 81
D. 243

20.3. A recursive formula tells you:

A. every term directly from n only
B. how to get each term from earlier term(s)
C. the graph of a function
D. the area of a figure

20.4. The coefficient of x^2 in (x + 1)^2 is:

A. 1
B. 2
C. 3
D. 4

20.5. In proof by induction, after checking the base case, you usually:

A. assume the statement is true for k
B. set n = 0 forever
C. draw a graph
D. differentiate both sides

21. Find the sum of the first 4 terms of 3, 6, 12, 24. Answer with a number.

21.1. What is the next term in 7, 11, 15, 19, ...?

A. 21
B. 22
C. 23
D. 24

21.2. What is the next term in 3, 9, 27, ...?

A. 30
B. 54
C. 81
D. 243

21.3. A recursive formula tells you:

A. every term directly from n only
B. how to get each term from earlier term(s)
C. the graph of a function
D. the area of a figure

21.4. The coefficient of x^2 in (x + 1)^2 is:

A. 1
B. 2
C. 3
D. 4

21.5. In proof by induction, after checking the base case, you usually:

A. assume the statement is true for k
B. set n = 0 forever
C. draw a graph
D. differentiate both sides

22. If a1 = 2 and a_n = a_(n-1) + 3, find a4. Answer with a number.

22.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

22.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

22.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

22.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

22.5. For a_n = 4 + 2(n - 1), what is a_5?

A. 10
B. 12
C. 14
D. 16

23. If a1 = 5 and a_n = 2a_(n-1), find a4. Answer with a number.

23.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

23.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

23.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

23.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

23.5. For a_n = 4 + 2(n - 1), what is a_5?

A. 10
B. 12
C. 14
D. 16

24. What is the middle coefficient in the expansion of (x + y)^4? Answer with a number.

24.1. The goal of mathematical induction is to prove a statement for:

A. one value only
B. all integers in a pattern
C. only negative numbers
D. only even numbers

24.2. After proving the base case, what comes next in induction?

A. assume the statement for k and prove it for k + 1
B. graph the sequence
C. differentiate both sides
D. set n = 0 again

24.3. Binomial coefficients in (a + b)^n count:

A. powers of a only
B. how terms combine in the expansion
C. zeros of the polynomial
D. slopes of a graph

24.4. Pascal's triangle is useful for:

A. graphing logarithms
B. reading binomial coefficients
C. solving inequalities
D. finding asymptotes

24.5. A binomial coefficient like C(5, 2) counts:

A. ordered arrangements
B. ways to choose 2 objects from 5
C. the square of 5
D. the slope of a line

25. Write an explicit formula for the arithmetic sequence with a1 = 4 and d = 3. Answer in the form n = ...

25.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

25.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

25.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

25.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

25.5. For a_n = 4 + 2(n - 1), what is a_5?

A. 10
B. 12
C. 14
D. 16

26. Write an explicit formula for the geometric sequence with a1 = 5 and r = 2. Answer in the form n = ...

26.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

26.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

26.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

26.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

26.5. For a_n = 4 + 2(n - 1), what is a_5?

A. 10
B. 12
C. 14
D. 16

27. Write a recursive formula for 3, 7, 11, 15, ... Answer as an equation.

27.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

27.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

27.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

27.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

27.5. For a_n = 4 + 2(n - 1), what is a_5?

A. 10
B. 12
C. 14
D. 16

28. Write a recursive formula for 2, 6, 18, 54, ... Answer as an equation.

28.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

28.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

28.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

28.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

28.5. For a_n = 4 + 2(n - 1), what is a_5?

A. 10
B. 12
C. 14
D. 16

29. Write the expansion of (x + y)^2. Answer as an equation.

29.1. What is the next term in 7, 11, 15, 19, ...?

A. 21
B. 22
C. 23
D. 24

29.2. What is the next term in 3, 9, 27, ...?

A. 30
B. 54
C. 81
D. 243

29.3. A recursive formula tells you:

A. every term directly from n only
B. how to get each term from earlier term(s)
C. the graph of a function
D. the area of a figure

29.4. The coefficient of x^2 in (x + 1)^2 is:

A. 1
B. 2
C. 3
D. 4

29.5. In proof by induction, after checking the base case, you usually:

A. assume the statement is true for k
B. set n = 0 forever
C. draw a graph
D. differentiate both sides

30. Write the expansion of (x + 1)^3. Answer as an equation.

30.1. What is the next term in 7, 11, 15, 19, ...?

A. 21
B. 22
C. 23
D. 24

30.2. What is the next term in 3, 9, 27, ...?

A. 30
B. 54
C. 81
D. 243

30.3. A recursive formula tells you:

A. every term directly from n only
B. how to get each term from earlier term(s)
C. the graph of a function
D. the area of a figure

30.4. The coefficient of x^2 in (x + 1)^2 is:

A. 1
B. 2
C. 3
D. 4

30.5. In proof by induction, after checking the base case, you usually:

A. assume the statement is true for k
B. set n = 0 forever
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D. differentiate both sides

31. Which explicit formula matches the arithmetic sequence 5, 8, 11, 14, ...?

A. a_n = 5 + 3(n - 1)
B. a_n = 5(3)^(n - 1)
C. a_n = 3 + 5n
D. a_n = n^2 + 4

31.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

31.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

31.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
B. an initial term
C. the slope
D. an intercept

31.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

31.5. For a_n = 4 + 2(n - 1), what is a_5?

A. 10
B. 12
C. 14
D. 16

32. Which explicit formula matches the geometric sequence 3, 6, 12, 24, ...?

A. a_n = 3 + 2(n - 1)
B. a_n = 2(3)^(n - 1)
C. a_n = 3(2)^(n - 1)
D. a_n = 3n + 2

32.1. Which sequence is arithmetic?

A. 2, 5, 8, 11
B. 3, 6, 12, 24
C. 1, 4, 9, 16
D. 2, 4, 7, 11

32.2. Which sequence is geometric?

A. 4, 8, 12, 16
B. 2, 6, 18, 54
C. 5, 9, 13, 17
D. 1, 3, 6, 10

32.3. A recursive sequence formula needs a recurrence rule and:

A. a graph
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32.4. An explicit formula for a sequence lets you find:

A. any term directly from n
B. only the next term
C. only the first term
D. the slope of the sequence

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A. 10
B. 12
C. 14
D. 16