

Patterns and Sums - Practice

1 What equation would give you the sum of this set of integers?

$$1 + 2 + \dots + 18 + 19$$

A $\frac{19(19+1)}{2}$

B $\frac{18(18+1)}{2}$

C $\frac{20(20+1)}{2}$

3 What would the described sum be?

The sum of all integers from 1 to 17, inclusive

A 153

B 171

C 136

D 152

2 What equation in summation form would describe what this equation calculates?

$$\frac{19(19+1)}{2}$$

A $\sum_{n=1}^{19} n + 1$

B $\sum_{n=1}^{19} n$

C $\sum_{n=2}^{19} n$

D $\sum_{n=1}^{20} n$

E $\sum_{n=1}^{18} n$

4 What equation would let you calculate this summation form?

$$\sum_{n=1}^{17} n$$

A $\frac{17(17+1)}{2}$

B $\frac{17(17+1)}{17}$

C $\frac{16(16+1)}{2}$

D $\frac{18(18+1)}{2}$

5 What would the described sum be?

The sum of all integers from 1 to 34, inclusive

A 595

B 594

C 630

D 561

6 What would the sum be for this set of integers?

$$1 + 2 + \dots + 10 + 11$$

A 78

B 65

C 66

D 55

**Patterns and Sums - Practice****7** What would the sum be for this set of integers?

$$1 + 2 + \dots + 29 + 30$$

A 464	B 435
C 496	D 465

8 What is the sum of the integers from 1 to 14 based on this equation?

$$\frac{14(14 + 1)}{2}$$

A 105	B 91
C 120	D 104

9 What is the sum of the integers from 1 to 34 based on this equation?

$$\frac{34(34 + 1)}{2}$$

A 561	B 630
C 595	D 594

10 What is the sum of the integers of this summation form?

$$\sum_{n=1}^{18} n$$

A 171	B 153
C 190	D 170

11 What is the sum of the integers of this summation form?

$$\sum_{n=1}^{34} n$$

A 594	B 595
C 561	D 630

12 Find the ones digit of this number once multiplied

$$9^4 \cdot 6^4$$

A 9	B 3	C 6
D 4	E 1	F 2

13 Find the ones digit of this number once multiplied

$$9^8 \cdot 2^8$$

A 9	B 1	C 8
D 4	E 6	F 2

14 Find the ones digit of this number once multiplied

$$2^8 \cdot 3^8$$

A 3	B 2	C 9
D 4	E 6	F 5

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- 15** Find the ones digit of this number once multiplied
 $9^{81} \cdot 4^{81}$

A 7	B 6	C 1
D 9	E 5	F 2

- 16** Find the ones digit of this number once multiplied
 $4^{46} \cdot 9^{46}$

A 6	B 0	C 5
D 7	E 4	F 1

- 17** Find the ones digit of this number once multiplied
 $2^{73} \cdot 7^{73}$

A 5	B 3	C 4
D 1	E 6	F 2

- 18** Choose the first values that this equation would create starting with $n=1$

$$a_n = 3 + 4(n - 1)$$

A 3, 7, 10, 17, 27	B -1, 3, 7, 11, 15
C 6, 10, 14, 18, 22	D 3, 10, 17, 24, 31
E 7, 11, 15, 19, 23	F 3, 7, 11, 15, 19

- 19** Choose the first values that this equation would create starting with $n=1$

$$a_n = 27 - 6(n - 1)$$

A 26, 20, 14, 8	B 29, 23, 17, 11
C 30, 24, 18, 12	D 27, 21, 15, 9
E 27, 17, 7, -3	F 27, 33, 39, 45

- 20** Choose the rule that describes this increasing pattern

3, 5, 7, 9, 11

A Start at 3 and subtract 2 for each term	B Start at -1 and add 2 for each term
C Start at 3 and add 2 for each term	D Start at 3 and add 6 for each term
E Start at 5 and add 2 for each term	F Start at 3 and add -2 for each term

- 21** Choose the rule that describes this decreasing pattern

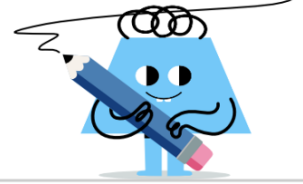
19, 15, 11, 7

A Start at 19 and add 4 for each term	B Start at 19 and subtract 1 for each term
C Start at 22 and subtract 4 for each term	D Start at 19 and subtract 0 for each term
E Start at 23 and subtract 4 for each term	F Start at 19 and subtract 4 for each term

- 22** Find the term that would complete this geometric pattern in the missing space

1, ?, 4, 8, 16, 32

A 32	B 17	C 27
D 3	E 7	F 2



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- 23** Find the term that would complete this geometric pattern in the missing space

?, 6, 12, 24, 48, 96

A 3	B 8	C 13
D 22	E 18	F 12

- 24** Find the term that would complete this geometric pattern in the missing space

3, 15, ?, 375

A 80	B 90	C 75
D 55	E 65	F 105

- 25** What are the first 3 terms, starting with $p = 1$ in this number sequence

$$4 + 7p$$

A 13, 20, 27	B 29, 30, 31
C 11, 15, 19	D 3, 10, 17
E 12, 19, 26	F 11, 18, 25

- 26** What are the first 3 terms, starting with $r = 1$ in this number sequence

$$6 - 4r$$

A 4, 0, -4	B 10, 16, 22
C 2, -2, -6	D -2, -8, -14
E 1, -4, -9	F 10, 14, 18

- 27** Choose the first values that this pattern rule would create

Start at 2 and multiply by 5 for each term

A 2, 7, 12, 17	B 2, 7, 9, 16
C 4, 20, 100, 500	D -2, -10, -50, -250
E 2, -3, -8, -13	F 2, 10, 50, 250

- 28** What sequence, starting with $y = 1$, are these the first 3 terms of?

11, 20, 29

A $2 + 6y$	B $2 + 10y$
C $2 + 9y$	D $3 + 9y$
E $-1 + 9y$	F $2 + 7y$

- 29** Choose the rule that describes this geometric pattern

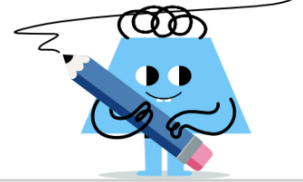
1, 5, 25, 125

A Start with 1 and 6. Add the prior two terms for each subsequent term	B Start at 1 and multiply by 7 for each term
C Start at 2 and multiply by 5 for each term	D Start at 1 and multiply by 1 for each term
E Start at 1 and multiply by 4 for each term	F Start at 1 and multiply by 5 for each term

- 30** What sequence, starting with $n = 1$, are these the first 3 terms of?

-2, -10, -18

A $7 - 8n$	B $6 - 8n$
C $3 - 8n$	D $5 - 8n$
E $6 - 9n$	F $8 - 8n$



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31 Find the rule that describes this pattern equation

$$a_n = 1 \times 5^{n-1}$$

A Start with 1 and 6. Add the prior two terms for each subsequent term

B Start at 1 and multiply by 5 for each term

C Start at 1 and add 5 for each term

D Start at 1 and multiply by 6 for each term

E Start at 1 and multiply by 3 for each term

F Start at 1 and multiply by 2 for each term

32 What is the term in this number sequence when $p = 3$

$$9p^2 + 6p + 6$$

A 78

B 105

C 168

D 141

E 69

F 57

33 Choose the first values that this equation would create starting with $n=1$

$$a_n = 1 \times 3^{n-1}$$

A 1, 4, 7, 10, 13, 16

B -2, -6, -18, -54, -162, -486

C 1, 4, 5, 9, 14, 23

D 2, 6, 18, 54, 162, 486

E 1, 3, 9, 27, 81, 243

F 1, -2, -5, -8, -11, -14

34 What is the term in this number sequence when $d = 1$

$$5d + 7 - 4d^2$$

A 12

B 0

C -7

D 8

E 4

F -9

35 Find the correct equation that this pattern rule describes

Start at 2 and multiply by 3 for each term

A $a_n = 5 \times 3^{n-1}$

B $a_n = 2 \times 3^{n-1}$

C $a_n = 2 + 3(n-1)$

D $a_n = 2 \times 3^n$

E $a_n = 2 \times 2^{n-1}$

F $a_n = 2 - 3(n-1)$

36 Find the correct equation to describe this geometric pattern where $n=1$ is the first term

2, 10, 50, 250

A $a_n = 4 \times 5^{n-1}$

B $a_n = 2 \times 5^n$

C $a_n = 2 \times 5^{n-1}$

D $a_n = 2 - 5(n-1)$

E $a_n = -1 \times 5^{n-1}$

F $a_n = 2 \times 4^{n-1}$

37 What are the first 3 terms, starting with $m = 1$ in this number sequence

$$5m^2 - 6m + 9$$

A 18, 17, 16

B 15, 78, 249

C 20, 41, 72

D 8, 17, 36

E -9, 3, 27

F 21, 42, 81

38 What are the first 3 terms, starting with $z = 1$ in this number sequence

$$8 - 5z - 8z^2$$

A -5, -44, -109

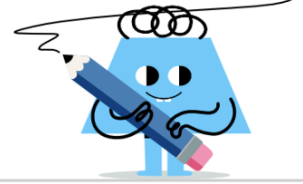
B -11, -30, -65

C -21, -50, -95

D -8, -18, -38

E -21, -34, -47

F -5, -34, -79



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39 What sequence, starting with $m = 1$, are these the first 3 terms of?

7, 29, 61

A $5m^2 + 7m - 6$ B $5m^2 + 8m - 5$

C $6m^2 + 7m - 5$ D $2m^2 + 7m - 5$

E $5m^2 + 7m - 5$ F $7m^2 + 7m - 5$

40 What sequence, starting with $c = 1$, are these the first 3 terms of?

0, -18, -50

A $3c + 4 - 4c^2$ B $3c + 4 - 8c^2$

C $3c + 4 - 7c^2$ D $3c + 4 - 5c^2$

E $3c + 1 - 7c^2$ F $3c + 4 - 9c^2$

41 What is the term
in this number
sequence when $m =$
1

$$9^m$$

A 9 B 18

C 1 D 27

42 What is the term
in this number
sequence when $d =$
1

$$6^d$$

A 18 B 6

C 1 D 12

43 What are the first 3 terms, starting with $y = 1$ in this
number sequence

$$3^y$$

A $3, 12, 27$ B $9, 12, 15$

C $3, 9, 27$ D $6, 12, 18$

E $3, 24, 81$ F $1, 8, 27$

44 What are the first 3 terms, starting with $p = 1$ in this
number sequence

$$9^p$$

A $9, 4608, 177147$ B $9, 81, 729$

C $18, 36, 54$ D $9, 36, 81$

E $1, 512, 19683$ F $27, 36, 45$

45 What sequence, starting with $d = 1$, are these the first 3 terms of?

2, 4, 8

A 2^d B 3^d C 1^d

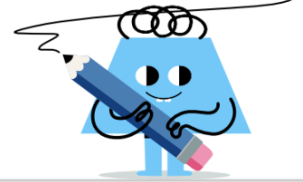
D 4^d E 0^d

46 What sequence, starting with $x = 1$, are these the first 3 terms of?

5, 25, 125

A 7^x B 3^x C 4^x

D 2^x E 5^x



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47 Find the term for $n=8$ given this pattern rule (first term is $n=1$)

Start at 2 and add 3 for each term

A 25	B 23	C 30
D 22	E 20	F -19

48 Find the term for $n=7$ given this pattern rule (first term is $n=1$)

Start at 32 and subtract 2 for each term

A 2,048	B 2	C 22
D 20	E 21	F 44

49 Find the term for $n=14$ given this pattern rule (first term is $n=1$)

Start at 1 and add 4 for each term

A 53	B 56	C 51
D 105	E -51	F 54

50 Find the rule that describes this pattern equation

$$a_n = 3 + 5(n - 1)$$

A Start at 3 and add 5 for each term	B Start at 3 and subtract 5 for each term
C Start at 3 and add 2 for each term	D Start at 3 and add 8 for each term
E Start at -1 and add 5 for each term	F Start with 3 and 8. Add the prior two terms for each subsequent term

51 Find the term for $n=10$ given this pattern rule (first term is $n=1$)

Start at 72 and subtract 5 for each term

A 24	B 117	C 27
D 30	E 31	F 32

52 Find the rule that describes this pattern equation

$$a_n = 17 - 3(n - 1)$$

A Start at 17 and subtract 5 for each term	B Start at 17 and subtract 3 for each term
C Start at 15 and subtract 3 for each term	D Start at 19 and subtract 3 for each term
E Start with 17 and 20. Add the prior two terms for each subsequent term	F Start at 17 and subtract 1 for each term

53 Find the correct equation that this pattern rule describes

Start at 1 and add 3 for each term

A $a_n = 1 + 1(n - 1)$	B $a_n = 1 + 3(n - 1)$
C $a_n = 1 \times 3^{n-1}$	D $a_n = 5 + 3(n - 1)$
E $a_n = a_{n-2} + a_{n-1}$	F $a_n = 1 + -1(n - 1)$

54 Find the correct equation that this pattern rule describes

Start at 12 and subtract 2 for each term

A $a_n = 12 - 5(n - 1)$	B $a_n = 12 + 2(n - 1)$
C $a_n = 15 - 2(n - 1)$	D $a_n = 12 - -2(n - 1)$
E $a_n = 12 - 2(n - 1)$	F $a_n = 8 - 2(n - 1)$



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- 55** Find the correct equation to describe this increasing pattern where $n=1$ is the first term

2, 4, 6, 8

- | | |
|----------------------------|-----------------------|
| A $a_n = 2 \times 2^{n-1}$ | B $a_n = 2 + 1(n-1)$ |
| C $a_n = 2 + 2(n-1)$ | D $a_n = 2 + 5(n-1)$ |
| E $a_n = 6 + 2(n-1)$ | F $a_n = -1 + 2(n-1)$ |

- 56** Find the correct equation to describe this decreasing pattern where $n=1$ is the first term

10, 8, 6, 4

- | | |
|-----------------------|-----------------------------|
| A $a_n = 10 - 0(n-1)$ | B $a_n = 10 \times 2^{n-1}$ |
| C $a_n = 10 - 6(n-1)$ | D $a_n = 11 - 2(n-1)$ |
| E $a_n = 10 - 4(n-1)$ | F $a_n = 10 - 2(n-1)$ |

- 57** Find the term for $n=8$ given this pattern equation

$$a_n = 2 + 6(n-1)$$

- | | |
|------|-----------|
| A 72 | B 41 |
| C 37 | D 44 |
| E 39 | F 559,872 |

- 58** Find the term for $n=5$ given this pattern equation

$$a_n = 30 - 2(n-1)$$

- | | | |
|------|------|-------|
| A 23 | B 21 | C 19 |
| D 38 | E 22 | F 480 |

- 59** What would the addition equation be for the described sum?

The sum of all integers from 9 to 15, inclusive

- | | |
|------------------------------|-------------------------------|
| A $9 + 10 + \dots + 15 + 16$ | B $10 + 11 + \dots + 14 + 15$ |
| C $9 + 10 + \dots + 13 + 14$ | D $9 + 10 + \dots + 14 + 15$ |
| E $8 + 9 + \dots + 14 + 15$ | |

- 60** What would describe this sum of integers?

$14 + 15 + \dots + 23 + 24$

- | | |
|--|--|
| A The sum of all integers from 15 to 24, inclusive | B The sum of all integers from 13 to 24, inclusive |
| C The sum of all integers from 14 to 24, inclusive | D The sum of all integers from 14 to 23, inclusive |
| E The sum of all integers from 14 to 25, inclusive | |

- 61** What equation in summation form would describe this sum?

$5 + 6 + \dots + 12 + 13$

- | | |
|-----------------------|-----------------------|
| A $\sum_{n=5}^{12} n$ | B $\sum_{n=5}^{13} n$ |
| C $\sum_{n=4}^{13} n$ | D $\sum_{n=2}^{13} n$ |

- 62** What would describe the sum this summation form indicates?

$$\sum_{n=16}^{22} n$$

- | | |
|--|--|
| A The sum of all integers from 15 to 22, inclusive | B The sum of all integers from 17 to 22, inclusive |
| C The sum of all integers from 16 to 23, inclusive | D The sum of all integers from 16 to 22, inclusive |
| E The sum of all integers from 16 to 21, inclusive | |



Patterns and Sums - Practice

63 What equation in summation form would describe this sum?

The sum of all integers from 9 to 14, inclusive

A
$$\sum_{n=2}^{14} n$$

B
$$\sum_{n=8}^{14} n$$

C
$$\sum_{n=9}^{15} n$$

D
$$\sum_{n=9}^{14} n$$

E
$$\sum_{n=9}^{14} n + 1$$

64 What would the described sum be?

The sum of all integers from 7 to 12, inclusive

A 63

B 45

C 50

D 70

E 57

65 What would the sum be for this set of integers?

$2 + 3 + \dots + 10 + 11$

A 65

B 66

C 77

D 54

E 63

66 What is the sum of the integers of this summation form?

$$\sum_{n=4}^{11} n$$

A 56

B 60

C 63

D 72

E 49