

### Pattern Puzzles – Pack 3

**Puzzle 1.** What number replaces the question mark in the grid?

5	3	7
9	1	16
1	17	?

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**Puzzle 2.** What comes next in the sequence?

3	13	39	105	283	789	2271	?
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**Puzzle 3.** What comes next in the sequence?

10	3	9	14	14	9	16	19	18	15	23	24	?
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**Puzzle 4.** What comes next in the sequence?

5	31	121	341	781	1555	2801	4681	?
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**Puzzle 5.** What comes next in the sequence?

2	5	11	10	8	12	14	17	14	19	17	24	?
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**Puzzle 6.** What number replaces the question mark in the grid?

6	6	8
11	21	29
11	9	?

- A) 7     
  B) 9     
  C) 11     
  D) 8

**Puzzle 7.** What comes next in the sequence?

2	6	14	28	52	94	170	?
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- A) 312     
  B) 311     
  C) 298     
  D) 184

**Puzzle 8.** What comes next in the sequence?

14	4	7	15	17	7	14	18	20	10	21	21	?
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- A) 13     
  B) 24     
  C) 23     
  D) 20

**Puzzle 9.** What number replaces the question mark in the grid?

3	6	16
8	4	24
1	4	?

- A) 33     
  B) 44     
  C) 31     
  D) 45

**Puzzle 10.** What comes next in the sequence?

6	30	116	330	762	1526	2760	4626	?
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- A) 7334     
  B) 7310     
  C) 7286     
  D) 4626

## Answer Key

1. **C) 5**

Column sums are triangular numbers: 15, 21, 28.

6. **D) 8**

Column sums are triangular numbers: 28, 36, 45.

2. **C) 6673**

Formula:  $3^n + 2n(n-1)$ .  $n=8$ :  $6561 + 112 = 6673$ .

7. **A) 312**

Formula:  $2^n + 1n(n-1)$ .  $n=8$ :  $256 + 56 = 312$ .

3. **A) 22**

Four interleaved arithmetic series (period 4):

8. **C) 23**

Four interleaved arithmetic series (period 4):

4. **C) 7381**

4th differences are all 24 (quartic sequence).

9. **B) 44**

Row sums are perfect squares: 25, 36, 49.

5. **A) 20**

Four interleaved arithmetic series (period 4):

10. **B) 7310**

4th differences are all 24 (quartic sequence).