

Grade 4 - Number and Shape Patterns - Answer Key

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Use this answer key to check every problem on the number patterns worksheet. Each solution lists the terms step by step and explains the odd and even features, so mistakes are easy to find and fix.

Grade 4 · Common Core State Standards: **4.OA.C.5**

Exercise 1 - Add 4 pattern

5, then $5+4=9$, $9+4=13$, $13+4=17$, $17+4=21$, $21+4=25$.

Answer: **5, 9, 13, 17, 21, 25**.

Exercise 2 - Subtract 6 pattern

$40-6=34$, $34-6=28$, $28-6=22$, $22-6=16$, $16-6=10$.

Answer: **40, 34, 28, 22, 16, 10**.

Exercise 3 - Multiply by 3 pattern

$2\times 3=6$, $6\times 3=18$, $18\times 3=54$, $54\times 3=162$.

Answer: **2, 6, 18, 54, 162**.

Exercise 4 - Find the rule

$12-7=5$, $17-12=5$, $22-17=5$. The rule is add 5.

$22+5=27$ and $27+5=32$.



The completed pattern.

Answer: **add 5; 27 and 32.**

Exercise 5 - Subtract 15 pattern

$100 - 15 = 85$, $85 - 15 = 70$, $70 - 15 = 55$, $55 - 15 = 40$.

Answer: **100, 85, 70, 55, 40.**

Exercise 6 - Complete the table

$3 + 9 = 12$, $5 + 9 = 14$, $8 + 9 = 17$, $10 + 9 = 19$, $14 + 9 = 23$.

Rule: add 9

Input	3	5	8	10	14
Output	12	14	17	19	23

The completed table.

Answer: **12, 14, 17, 19, 23.**

Exercise 7 - Multiply by 4 table

$2 \times 4 = 8$, $3 \times 4 = 12$, $5 \times 4 = 20$, $6 \times 4 = 24$, $9 \times 4 = 36$.

Answer: **8, 12, 20, 24, 36.**

Exercise 8 - Rule from a table

$7 - 2 = 5$, $9 - 4 = 5$, $11 - 6 = 5$, $13 - 8 = 5$. Each output is 5 more than its input.

Answer: **add 5.**

Exercise 9 - All odd numbers

1, 3, 5, 7, 9, 11.

Every term is odd. Adding 2 (an even number) to an odd number gives an odd number.

Answer: **1, 3, 5, 7, 9, 11; all terms are odd.**

Exercise 10 - Odd and even take turns

3, 8, 13, 18, 23, 28.

Odd, even, odd, even, odd, even. Adding 5 (an odd number) switches odd to even and even to odd.

Answer: **3, 8, 13, 18, 23, 28; the terms alternate odd, even.**

Exercise 11 - All even numbers

4, 10, 16, 22, 28, 34.

All are even. Adding 6, an even number, to an even number gives an even number.

Answer: **4, 10, 16, 22, 28, 34; all even.**

Exercise 12 - Doubling pattern

$6 \times 2 = 12$, $12 \times 2 = 24$, $24 \times 2 = 48$, $48 \times 2 = 96$.

Terms: 6, 12, 24, 48, 96. The last digits are 6, 2, 4, 8, 6. All terms are even.

Answer: **6, 12, 24, 48, 96; all even, last digits 6, 2, 4, 8, 6.**

Exercise 13 - Toothpick squares

4, 7, 10 increases by 3 each time. The rule is start at 4, add 3.

4 squares: $10 + 3 = 13$. 5 squares: $13 + 3 = 16$.



4 squares: 13



5 squares: 16

Squares 4 and 5.

Answer: **add 3; 13 toothpicks and 16 toothpicks.**

Exercise 14 - Which numbers appear?

List the terms: 1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34.

25 and 34 are in the list. 29 is not, because it falls between 28 and 31.

Answer: **25 and 34.**

Exercise 15 - Jar of coins

Monday: \$12. Tuesday: $12+4=16$. Wednesday: $16+4=20$. Thursday: $20+4=24$. Friday: $24+4=28$.

Answer: **\$12, \$16, \$20, \$24, \$28.**

Exercise 16 - Packs of fish

Multiply the number of packs by 6.

$1 \times 6 = 6$, $2 \times 6 = 12$, $3 \times 6 = 18$, $4 \times 6 = 24$, $5 \times 6 = 30$, $8 \times 6 = 48$.

Answer: **6, 12, 18, 24, 30, 48 fish.**

Exercise 17 - Triangle sticks

3, 5, 7 increases by 2 each time. Continue: 9, 11, 13, 15, 17, 19, 21 for triangles 4 through 10.



4 triangles: 9



5 triangles: 11

Triangles 4 and 5.

The 10th term is $3+2 \times 9 = 21$.

Answer: **21 sticks.**

Exercise 18 - Draining tank

Subtract 25 each hour: 200, 175, 150, 125, 100, 75, 50, 25, 0.

After 5 hours: 75 gallons. The tank is empty at hour 8 because $25 \times 8 = 200$.

Answer: **75 gallons; 8 hours.**

Exercise 19 - Mei's rule

List the terms: 7, 15, 23, 31, 39, 47, 55, 63. Yes, 63 appears.

All terms are odd because 7 is odd and 8 is even. 100 is even, so it cannot appear.

Answer: **63 yes; 100 no, because every term is odd.**

Exercise 20 - Sofia's tenth term

Keep adding 5: 4, 9, 14, 19, 24, 29, 34, 39, 44, 49. The 10th number is 49.

Check: $4 + 9 \times 5 = 4 + 45 = 49$.

Answer: **Yes, the 10th number is 49.**