

Patterns Assignment

Fill in the missing numbers.

1. The rule for the pattern shown is $+10$.
2, _____, 22, 32, 42, _____,
2. The rule for the pattern shown is -5 .
50, _____, 40, 35, _____, 25,
3. The rule for the pattern shown is $+3$.
_____, _____, 16, 19, _____, 25
4. The rule for the pattern shown is $\times 4$.
1, 4, _____, 64, _____, _____

Find the next two numbers in each pattern.

5. The rule for the pattern shown is $+11$.
11, 22, 33, _____, _____
6. The rule for the pattern shown is -8 .
 $-1, -9, -17, _____, _____$
7. The rule for the pattern shown is $\div 2$.
64, 32, 16, _____, _____
8. The rule for the pattern shown is $\times 3$.
4, 12, 36, _____, _____

Patterns Assignment

Find the rule for the following pattern.

9. 5, 6, 7, 8, 9, 10, 11

<i>n</i>	1	2	3	4	5	6	7
	5	6	7	8	9	10	11

10. 0, 2, 4, 6, 8, 10, 12

<i>n</i>	1	2	3	4	5	6	7
	0	2	4	6	8	10	12

11. 4, 7, 10, 13, 16, 19, 22

<i>n</i>	1	2	3	4	5	6	7
	4	7	10	13	16	19	22

Patterns Assignment

Find the common difference and the next number.

12. 100, 120, 140, 160, 180

13. -9, -19, -29, -39,

14. 1, 15, 29, 43

15. 1, -5, -11, -17

Find the common ratio and the next number.

16. 27, 9, 3, $1, \frac{1}{3}$

17. -1, 0.2, -0.04, 0.008, _____

18. 120, 60, 30, 15

19. $\frac{1}{2}$, 1, 2, 4

Patterns Assignment

ANSWERS

Fill in the missing numbers.

1. The rule for the pattern shown is +10.
2, _____, 22, 32, 42, _____,

$$\begin{aligned} 2 + 10 &= 12 \\ 12 + 10 &= 22 \\ 22 + 10 &= 32 \\ 32 + 10 &= 42 \\ 42 + 10 &= 52 \end{aligned}$$

2, **12**, 22, 32, 42, **52**

3. The rule for the pattern shown is +3.
_____, _____, 16, 19, _____, 25

$$\begin{aligned} 10 + 3 &= 13 \\ 13 + 3 &= 16 \\ 16 + 3 &= 19 \\ 19 + 3 &= 22 \\ 22 + 3 &= 25 \end{aligned}$$

10, **13**, 16, 19, **22**, 25

2. The rule for the pattern shown is -5.
50, _____, 40, 35, _____, 25,

$$\begin{aligned} 50 - 5 &= 45 \\ 45 - 5 &= 40 \\ 40 - 5 &= 35 \\ 35 - 5 &= 30 \\ 30 - 5 &= 25 \end{aligned}$$

50, **45**, 40, 35, **30**, 25

4. The rule for the pattern shown is * 4.
1, 4, _____, 64, _____, _____

$$\begin{aligned} 1 * 4 &= 4 \\ 4 * 4 &= 16 \\ 16 * 4 &= 64 \\ 64 * 4 &= 256 \\ 256 * 4 &= 1,024 \end{aligned}$$

1, 4, **16**, 64, **256**, **1,024**

Find the next two numbers in each pattern.

5. The rule for the pattern shown is +11.
11, 22, 33, _____, _____

$$\begin{aligned} 11 + 11 &= 22 \\ 22 + 11 &= 33 \\ 33 + 11 &= 44 \\ 44 + 11 &= 55 \end{aligned}$$

11, 22, 33, **44**, **55**

6. The rule for the pattern shown is -8.
-1, -9, -17, _____, _____

$$\begin{aligned} -1 - 8 &= -9 \\ -9 - 8 &= -17 \\ -17 - 8 &= -25 \\ -25 - 8 &= -33 \end{aligned}$$

-1, -9, -17, **-25**, **-33**

7. The rule for the pattern shown is $\div 2$.
64, 32, 16, _____, _____

$$\begin{aligned} 64 \div 2 &= 32 \\ 32 \div 2 &= 16 \\ 16 \div 2 &= 8 \\ 8 \div 2 &= 4 \end{aligned}$$

64, 32, 16, **8**, **4**,

8. The rule for the pattern shown is * 3.
4, 12, 36, _____, _____

$$\begin{aligned} 4 * 3 &= 12 \\ 12 * 3 &= 36 \\ 36 * 3 &= 108 \\ 108 * 3 &= 324 \end{aligned}$$

4, 12, 36, **108**, **324**

Patterns Assignment

Find the rule for the following pattern.

9. 5, 6, 7, 8, 9, 10, 11

n	1	2	3	4	5	6	7
n	1	2	3	4	5	6	7
$n + 4$	5	6	7	8	9	10	11

$+1 \quad +1 \quad +1 \quad +1 \quad +1 \quad +1$

The difference between successive values is always 1.

The rule is of the form $n + 4$

10. 0, 2, 4, 6, 8, 10, 12

n	1	2	3	4	5	6	7
$2n$	2	4	6	8	10	12	14
$2n - 2$	0	2	4	6	8	10	12

$+2 \quad +2 \quad +2 \quad +2 \quad +2 \quad +2$

The difference between successive values is always 2.

The rule is of the form $2n - 2$

11. 4, 7, 10, 13, 16, 19, 22

n	1	2	3	4	5	6	7
$3n$	3	6	9	12	15	18	21
$3n + 1$	4	7	10	13	16	19	22

$+3 \quad +3 \quad +3 \quad +3 \quad +3 \quad +3$

The difference between successive values is always 3,

The rule is of the form $3n + 1$

Patterns Assignment

Find the common difference and the next number.

12. 100, 120, 140, 160, 180

The pattern starts with **100** and continued by adding **20** to the last number each time.
The common difference is **20**

$$100 + 20 = 120$$

$$120 + 20 = 140$$

$$140 + 20 = 160$$

$$160 + 20 = 180$$

$$180 + 20 = 200$$

The next number is **200**

14. 1, 15, 29, 43

The pattern starts with **1** and continued by adding **14** to the last number each time.
The common difference is **14**

$$1 + 14 = 15$$

$$15 + 14 = 29$$

$$29 + 14 = 43$$

$$43 + 14 = 57 \quad \text{The next number is } 57$$

13. -9, -19, -29, -39,

The pattern starts with **-9** and continued by adding **-10** to the last number each time.
The common difference is **-10**

$$-9 - 10 = -19$$

$$-19 - 10 = -29$$

$$-29 - 10 = -39$$

$$-39 - 10 = -49$$

The next number is **-49**

15. 1, -5, -11, -17

The pattern starts with **1** and continued by adding **-6** to the last number each time.
The common difference is **-6**

$$1 - 6 = -5$$

$$-5 - 6 = -11$$

$$-11 - 6 = -17$$

$$-17 - 6 = -23 \quad \text{The next number is } -23$$

Find the common ratio and the next number.

16. 27, 9, 3, 1, $\frac{1}{3}$

The pattern starts with **27** and continued by multiplying by $\frac{1}{3}$ to the last number each time. The common ratio is $\frac{1}{3}$

$$27 * \frac{1}{3} = 9$$

$$9 * \frac{1}{3} = 3$$

$$3 * \frac{1}{3} = 1$$

$$1 * \frac{1}{3} = \frac{1}{3}$$

$$\frac{1}{3} * \frac{1}{3} = \frac{1}{9}$$

The next number is $\frac{1}{9}$

17. -1, 0.2, -0.04, 0.008, _____

The pattern starts with **-1** and continued by multiplying by **-0.2** to the last number each time. The common ratio is **-0.2**

$$-1 * (-0.2) = 0.2$$

$$0.2 * (-0.2) = -0.04$$

$$-0.04 * (-0.2) = 0.008$$

$$0.008 * (-0.2) = -0.0016$$

The next number is **-0.0016**

Patterns Assignment

18. 120, 60, 30, 15

The pattern starts with **120** and continued by multiplying by $\frac{1}{2}$ to the last number each time. The common ratio is $\frac{1}{2}$

$$120 * \frac{1}{2} = 60$$

$$60 * \frac{1}{2} = 30$$

$$30 * \frac{1}{2} = 15$$

$$15 * \frac{1}{2} = \frac{15}{2}$$

The next number is $\frac{15}{2}$

19. $\frac{1}{2}, 1, 2, 4$

The pattern starts with $\frac{1}{2}$ and continued by multiplying by **2** to the last number each time. The common ratio is **2**

$$\frac{1}{2} * 2 = 1$$

$$1 * 2 = 2$$

$$2 * 2 = 4$$

$$4 * 2 = 8$$

The next number is **8**