



Patterns and Early Algebra

1 Find the number that balances the equation

$$19 + 1 = ? + 2$$

A 13	B 2	C 0
D 19	E 20	F 18

2 Find the number that balances the equation

$$10 + 2 + 15 = 4 + ? + 1$$

A 21	B 23	C 19
D 17	E 25	F 22

3 Solve for the missing value

$$? + 14 + 3 = 20$$

A 5	B 9	C 10
D 11	E 3	F 6

4 Find the number that balances the equation

$$9 \times 2 = ? \times 3$$

A 9	B 20	C 6
D 0	E 4	F 2

5 Find the number that balances the equation

$$9 \times 8 = 6 \times ? \times 4$$

A 1	B 3	C 4
D 20	E 10	F 2

6 Find the number that balances the equation

$$7 \times 12 = ? \times 3$$

A 28	B 2	C 3
D 0	E 8	

7 Find the number that balances the equation

$$26 - 2 - 4 = 25 - 2 - ?$$

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

8 Find the number that balances the equation

$$18 - 15 = 26 - ?$$

A 19	B 3	C 23
D 27	E 22	F 21



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9 Solve for the missing value
 $? - 599 = 212$

A 757	B 865	C 946
D 676	E 595	F 811

10 Choose the rule that describes this geometric pattern

3, 15, 75, 375

- | | |
|--|--|
| A Start at 3 and multiply by 9 for each term | B Start with 3 and 8. Add the prior two terms for each subsequent term |
| C Start at 3 and multiply by 8 for each term | D Start at 3 and multiply by 5 for each term |
| E Start at 3 and multiply by 7 for each term | F Start at 3 and multiply by 2 for each term |

11 What is the missing value in the table?

Input	Output
3	24
4	?
5	40
6	48
8	64

- | | |
|---|----|
| A | 1 |
| B | 32 |
| C | 11 |
| D | 12 |

12 Choose the rule that describes this pattern



- A ship, car, plane, then repeat
- B car, bike, then repeat

13 Choose the rule that describes this pattern



- A fish, fries, hamburger, then repeat
- B fish, hamburger, fish, noodles, then repeat



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14 What is the missing value in the table?

Input	Output
2	0
4	2
6	4
12	10
14	?

A

23

B

12

C

8

D

13

15 What is the missing value in the table?

Input	Output
1	7
3	21
5	35
7	?
9	63

A

21

B

77

C

42

D

49



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16 What rule turns each input into its output?

Input	Output
5	1
10	2
15	3
40	8
45	9

A

divide by 5

B

subtract 4

C

subtract 6

D

divide by 10

17 What rule turns each input into its output?

Input	Output
12	7
13	8
14	9
15	10
16	11

A

subtract 4

B

subtract 5

C

subtract 10

D

add 11



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18 Find the term that would be next in this increasing pattern

2, 4, 6, ?

A 3	B 14	C 11
D 4	E 8	F 9

19 What are the next 3 numbers in the pattern, skip counting upwards by 2

4, 6, 8, __, __, __

A 11, 13, 15	B 10, 11, 12
C 10, 12, 14	D 11, 14, 17
E 11, 12, 13	F 10, 13, 16

20 Find the term that would be next in this repeating pattern

0, 6, 0, 6, 0, 6, ?

A 0	B 6
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21 Find the term that would be next in this repeating pattern

3, 2, 9, 3, 2, 9, 3, 2, 9, 3, ?

A 9	B 3
C 2	

22 Which numbers follow this pattern rule?

Find that 1, 6 repeats and repeat those numbers

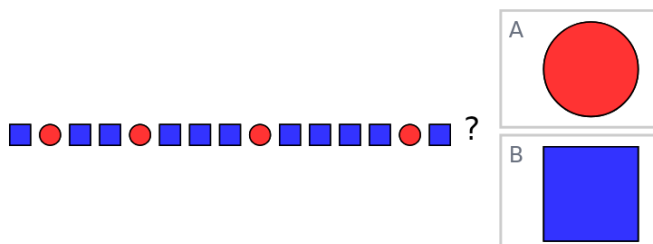
A 1, 6, 1, 6	B 3, 6, 9, 12
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23 Choose the first values that this pattern rule would create

Start at 2 and add 6 for each term

A 2, 10, 18, 26, 34	B -2, 4, 10, 16, 22
C 2, 8, 14, 20, 26	D 3, 9, 15, 21, 27
E 2, 12, 72, 432, 2,592	F 1, 7, 13, 19, 25

24 Find the item that would be next in this growing pattern



25 Find the term for $n=6$ in this increasing pattern (first term is $n=1$)

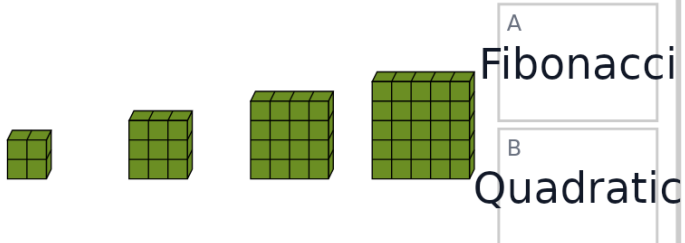
2, 7, 12, 17, 22

A 29	B 31	C 6,250
D -23	E 7	F 27



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26 What type of pattern is shown here?
4, 9, 16, 25



27 What pattern type do these numbers form?

1, 1, 2, 3, 5, 8, 13

- | | |
|---|-------------------------|
| A | Fibonacci |
| B | Increasing (Arithmetic) |

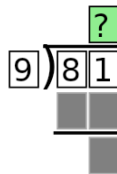
28 Solve the one-step equation for x.
 $x + 10 = 20$

- | | |
|---|----------|
| A | $x = 12$ |
| B | $x = 11$ |
| C | $x = 10$ |
| D | $x = 9$ |

29 Solve for the variable in the equation
 $p - 8 = -4$

- | | | | |
|---|---------|---|---------|
| A | $p = 7$ | B | $p = 2$ |
| C | $p = 1$ | D | $p = 4$ |
| E | $p = 5$ | F | $p = 3$ |

30 How many 9s fit into 81?



- | | | | | | |
|---|----|---|---|---|----|
| A | 17 | B | 0 | C | 6 |
| D | 10 | E | 9 | F | 18 |

31 What number can be put in the circle to make this equation correct?

$$2 \cdot \bigcirc = 14$$

- | | | | |
|---|----------------|---|-----------------|
| A | $\bigcirc = 8$ | B | $\bigcirc = 9$ |
| C | $\bigcirc = 4$ | D | $\bigcirc = 7$ |
| E | $\bigcirc = 5$ | F | $\bigcirc = 10$ |

32 Solve the one-step equation for x.
 $4x = 44$

- | | |
|---|----------|
| A | $x = 10$ |
| B | $x = 12$ |
| C | $x = 13$ |
| D | $x = 11$ |

33 What number can be put in the circle to make this equation correct?

$$\bigcirc \div 3 = 7$$

- | | | | |
|---|-----------------|---|-----------------|
| A | $\bigcirc = 24$ | B | $\bigcirc = 23$ |
| C | $\bigcirc = 18$ | D | $\bigcirc = 21$ |
| E | $\bigcirc = 22$ | F | $\bigcirc = 19$ |



Patterns and Early Algebra

- 34** What number can be put in the circle to make this equation correct?

$$\bigcirc + 3 = 5$$

- | | |
|-------------------|------------------|
| A $\bigcirc = 3$ | B $\bigcirc = 4$ |
| C $\bigcirc = -1$ | D $\bigcirc = 2$ |
| E $\bigcirc = 5$ | F $\bigcirc = 0$ |

- 35** Solve the one-step equation for x.

$$x - 12 = 3$$

- | | |
|------------|------------|
| A $x = 16$ | B $x = 14$ |
| C $x = 15$ | D $x = 17$ |

- 36** Find the number that balances the equation

$$4 + 9 = 9 + ?$$

- | | | |
|-----|-----|------|
| A 4 | B 0 | C 20 |
| D 3 | E 8 | F 7 |

- 37** Find the number that balances the equation

$$3 + 4 = 8 - ?$$

- | | | |
|------|-----|-----|
| A 30 | B 5 | C 0 |
| D 3 | E 2 | F 1 |

- 38** Solve for the missing value

$$? + 17 + 4 = 78$$

- | | | |
|------|------|------|
| A 51 | B 57 | C 58 |
| D 64 | E 55 | F 59 |

- 39** Find the right equation to represent this problem:

How many pieces of candy would there be in total if 8 kids each have a bag containing 2 pieces of candy?

- | | |
|-----------|----------------|
| A $2 - 8$ | B $2 - 8$ |
| C $8/2$ | D 8×2 |
| E $8 + 2$ | F $8 + 2$ |

- 40** Find the right equation to represent this problem:

How many apples were eaten if a koala eats 18 grams of apples and each apple weighs 3 grams?

- | | |
|------------------|-----------------|
| A $18 + 3$ | B $18/3$ |
| C $3 - 18$ | D $18 + 3$ |
| E 18×23 | F 18×3 |