

Variables and Equations

Find the number each letter or symbol stands for.

Remember

A variable is a letter or a symbol that stands for a number we do not know.

$n + 7 = 15$ $\square + 7 = 15$ $\star + 7 = 15$ The number is 8 in all three.

Find the value of each variable.

Example $n + 9 = 23$ $n =$ 14

1. $45 - m = 18$ $m =$ _____

2. $7 \times b = 63$ $b =$ _____

3. $72 \div y = 6$ $y =$ _____

4. $\square - 16 = 29$ $\square =$ _____

5. $\star \div 6 = 9$ $\star =$ _____

6. $56 = 8 \times k$ $k =$ _____

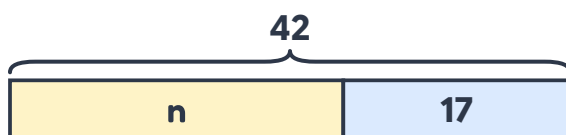
7. $34 = t + 19$ $t =$ _____

8. $p - 125 = 230$ $p =$ _____

9. $\square \times 12 = 96$ $\square =$ _____

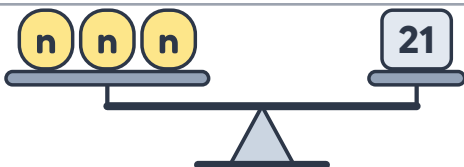
Match each model to its equation. Then find n.

Example



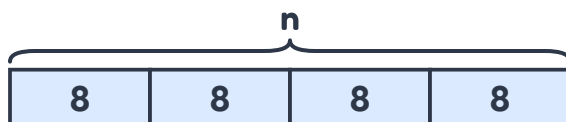
• $n \div 4 = 8$ $n =$ _____

10.



• $n + 17 = 42$ $n =$ 25

11.



• $n + 9 = 30$ $n =$ _____

12.



• $3 \times n = 21$ $n =$ _____

Variables and Equations

Write expressions with a variable. Find their values.

Write an expression for the words, or words for the expression.

In words	Expression
Example 5 more than a number n	$n + 5$
1. a number b divided by 4	_____
2. 9 less than a number m	_____
3. _____	$20 - t$
4. 6 times a number y	_____
5. a number p subtracted from 30	_____
6. _____	$36 \div d$
7. the sum of a number k and 14	_____

Find the value of each expression for each value of n .

Expression	when $n = 4$	when $n = 6$	when $n = 10$
Example $n + 15$	19	21	25
8. $3 \times n$	_____	_____	_____
9. $40 - n$	_____	_____	_____
10. $n \div 2$	_____	_____	_____
11. $2 \times n + 1$	_____	_____	_____

Find the value of each expression when $a = 7$ and $b = 3$.

Example $a \times b = 7 \times 3 = 21$

12. $a + b =$ _____

13. $2 \times a + b =$ _____

14. $a \times a - b =$ _____

Variables and Equations

Put in the value. Write equations and stories.

Is it true for the value given? Circle True or False.

$n = 6$

$a = 12$

Example

$n + 9 = 15$

True

False

1. $4 \times n > 20$

True

False

2. $30 \div n < 5$

True

False

3. $n \times n > 40$

True

False

4. $50 - a = 38$

True

False

5. $a \times 3 < 30$

True

False

6. $a \div 4 > 3$

True

False

7. $2 \times a + 1 = 25$

True

False

Write an equation with a variable for each story. Then solve.

Example

Kai got 18 more marbles. Now he has 45. How many did he have before?

Equation: $m + 18 = 45$

Answer: $m = 27$ marbles

8. 6 cans of juice cost \$18. Each can costs the same. What does one can cost?

Equation: _____

Answer: _____

9. A rope is cut into 4 equal pieces of 12 feet. How long was the rope?

Equation: _____

Answer: _____

10. Lena spent \$35 at a fair and has \$40 left. How much did she have before?

Equation: _____

Answer: _____

Write a story problem for each equation. Then solve it.

11. $b - 14 = 30$

Answer: _____

12. $5 \times p = 40$

Answer: _____

Variables and Equations

Find the rule. Write it as an expression with n .

Find the rule and write it with n . Fill in the missing numbers.

Example

Rule: Out = $n + 7$

In n	3	5	8	10	12
Out	10	12	15	17	19

1. Rule: Out = _____

In n	2	3	5	7	
Out	8	12			36

2. Rule: Out = _____

In n	6	9	15	21	30
Out	2	3	5		

3. Rule: Out = _____

In n	1	2	3	4	6
Out	3	5	7		

Add or multiply? Circle one. Then write the rule.

Example

Rule: Out = $n + 5$

In n	1	2	3	4
Out	6	7	8	9

Add

Multiply

4. Rule: Out = _____

In n	2	4	6	8
Out	12	24	36	48

Add

Multiply

5. Rule: Out = _____

In n	3	6	9	12
Out	13	16	19	22

Add

Multiply

6. Rule: Out = _____

In n	5	6	7	8
Out	35	42	49	56

Add

Multiply

Use the table to solve the story problem.

7. A ride at a fair costs \$3 for each ticket. Fill in the table. Write an expression for the cost of n tickets. Then find the cost of 12 tickets.

Tickets n	1	2	3	4	5
Cost (\$)	3	6			

Cost of n tickets: _____

Cost of 12 tickets: _____

Variables and Equations

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A variable is a letter or a symbol that stands for a number we do not know.

$n + 7 = 15$ $\square + 7 = 15$ $\star + 7 = 15$ The number is 8 in all three.

Find the value of each variable.

Example $n + 9 = 23$ $n =$ 14

1. $45 - m = 18$ $m =$ _____

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4. $\square - 16 = 29$ $\square =$ _____

5. $\star \div 6 = 9$ $\star =$ _____

6. $56 = 8 \times k$ $k =$ _____

7. $34 = t + 19$ $t =$ _____

8. $p - 125 = 230$ $p =$ _____

9. $\square \times 12 = 96$ $\square =$ _____

Match each model to its equation. Then find n.

Example



$n \div 4 = 8$ $n =$ _____

10.



$n + 17 = 42$ $n =$ 25

11.



$n + 9 = 30$ $n =$ _____

12.



$3 \times n = 21$ $n =$ _____

Variables and Equations

Do the two sides have the same value?

Write = or $\neq$ in each circle.

Example

$$\underset{12}{4 \times 3} \quad \text{○} \quad \underset{12}{2 \times 6}$$

1. $24 \div 4$ ○ $3 + 4$

2. $45 - 9$ ○ 6×6

3. 7×8 ○ $60 - 5$

4. $63 \div 7$ ○ $18 \div 2$

5. $120 + 80$ ○ 4×60

6. 9×6 ○ 8×7

7. $100 \div 4$ ○ 5×5

Write a number or an expression to make each equation true.

Example

$$5 \times 6 = 3 \times \underline{10}$$

8. $6 \times 8 = 4 \times \underline{\hspace{2cm}}$

9. $56 \div 7 = \underline{\hspace{2cm}} - 12$

10. $\underline{\hspace{2cm}} \times 3 = 90 \div 2$

11. $4 \times 9 = \underline{\hspace{2cm}}$

12. $48 \div 6 = \underline{\hspace{2cm}}$

Is each equation true? Circle True or False. Then tell why.

Example

$$8 \times 5 = 40 + 2$$

True

False

Why? 8×5 is 40, not 42.

13. $72 \div 8 = 3 \times 3$

True

False

Why? _____

14. $50 - 14 = 4 \times 9$

True

False

Why? _____

15. $6 \times 7 = 6 + 7 + 30$

True

False

Why? _____

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Write expressions with a variable. Find their values.

Write an expression for the words, or words for the expression.

In words	Expression
Example 5 more than a number n	$n + 5$
1. a number b divided by 4	
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Find the value of each expression for each value of n .

Expression	when $n = 4$	when $n = 6$	when $n = 10$
Example $n + 15$	19	21	25
8. $3 \times n$			
9. $40 - n$			
10. $n \div 2$			
11. $2 \times n + 1$			

Find the value of each expression when $a = 7$ and $b = 3$.

Example

 $a \times b = 7 \times 3 = 21$

12. $a + b =$ _____

13. $2 \times a + b =$ _____

14. $a \times a - b =$ _____

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Put in the value. Write equations and stories.

Is it true for the value given? Circle True or False.

$n = 6$

$a = 12$

Example

$n + 9 = 15$

True

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2. $30 \div n < 5$

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Write an equation with a variable for each story. Then solve.

Example

Kai got 18 more marbles. Now he has 45. How many did he have before?

Equation: $m + 18 = 45$

Answer: $m = 27$ marbles

8. 6 cans of juice cost \$18. Each can costs the same. What does one can cost?

Equation: _____

Answer: _____

9. A rope is cut into 4 equal pieces of 12 feet. How long was the rope?

Equation: _____

Answer: _____

10. Lena spent \$35 at a fair and has \$40 left. How much did she have before?

Equation: _____

Answer: _____

Write a story problem for each equation. Then solve it.

11. $b - 14 = 30$

Answer: _____

12. $5 \times p = 40$

Answer: _____

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Example

Rule: Out = $n + 7$

In n	3	5	8	10	12
Out	10	12	15	17	19

1. Rule: Out = _____

In n	2	3	5	7	
Out	8	12			36

2. Rule: Out = _____

In n	6	9	15	21	30
Out	2	3	5		

3. Rule: Out = _____

In n	1	2	3	4	6
Out	3	5	7		

Add or multiply? Circle one. Then write the rule.

Example

Rule: Out = $n + 5$

In n	1	2	3	4
Out	6	7	8	9

Add

Multiply

4. Rule: Out = _____

In n	2	4	6	8
Out	12	24	36	48

Add

Multiply

5. Rule: Out = _____

In n	3	6	9	12
Out	13	16	19	22

Add

Multiply

6. Rule: Out = _____

In n	5	6	7	8
Out	35	42	49	56

Add

Multiply

Use the table to solve the story problem.

7. A ride at a fair costs \$3 for each ticket. Fill in the table. Write an expression for the cost of n tickets. Then find the cost of 12 tickets.

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Cost (\$)	3	6			

Cost of n tickets: _____

Cost of 12 tickets: _____

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Find the value of each variable.

Example $n + 9 = 23$ $n = \underline{14}$

1. $45 - m = 18$ $m = \underline{27}$

2. $7 \times b = 63$ $b = \underline{9}$

3. $72 \div y = 6$ $y = \underline{12}$

4. $\square - 16 = 29$ $\square = \underline{45}$

5. $\star \div 6 = 9$ $\star = \underline{54}$

6. $56 = 8 \times k$ $k = \underline{7}$

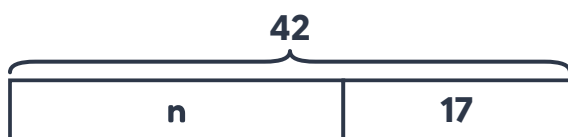
7. $34 = t + 19$ $t = \underline{15}$

8. $p - 125 = 230$ $p = \underline{355}$

9. $\square \times 12 = 96$ $\square = \underline{8}$

Match each model to its equation. Then find n.

Example



$n \div 4 = 8$ $n = \underline{32}$

10.



$n + 17 = 42$ $n = \underline{25}$

11.



$n + 9 = 30$ $n = \underline{21}$

12.



$3 \times n = 21$ $n = \underline{7}$

Variables and Equations

Do the two sides have the same value?

Write = or $\neq$ in each circle.

Example

$$4 \times 3 \quad \text{12} \quad = \quad 2 \times 6 \quad \text{12}$$

$$1. \quad 24 \div 4 \quad \text{6} \quad \neq \quad 3 + 4 \quad \text{7}$$

$$2. \quad 45 - 9 \quad \text{36} \quad = \quad 6 \times 6 \quad \text{36}$$

$$3. \quad 7 \times 8 \quad \text{56} \quad \neq \quad 60 - 5 \quad \text{55}$$

$$4. \quad 63 \div 7 \quad \text{9} \quad = \quad 18 \div 2 \quad \text{9}$$

$$5. \quad 120 + 80 \quad \text{200} \quad \neq \quad 4 \times 60 \quad \text{240}$$

$$6. \quad 9 \times 6 \quad \text{54} \quad \neq \quad 8 \times 7 \quad \text{56}$$

$$7. \quad 100 \div 4 \quad \text{25} \quad = \quad 5 \times 5 \quad \text{25}$$

Write a number or an expression to make each equation true.

Example

$$5 \times 6 = 3 \times \underline{10}$$

$$8. \quad 6 \times 8 = 4 \times \underline{12}$$

$$9. \quad 56 \div 7 = \underline{20} - 12$$

$$10. \quad \underline{15} \times 3 = 90 \div 2$$

$$11. \quad 4 \times 9 = \underline{\text{e.g. } 40 - 4}$$

$$12. \quad 48 \div 6 = \underline{\text{e.g. } 3 + 5}$$

Is each equation true? Circle True or False. Then tell why.

Example

$$8 \times 5 = 40 + 2$$

True

False

Why? 8 × 5 is 40, not 42.

$$13. \quad 72 \div 8 = 3 \times 3$$

True

False

Why? Both sides are 9.

$$14. \quad 50 - 14 = 4 \times 9$$

True

False

Why? Both sides are 36.

$$15. \quad 6 \times 7 = 6 + 7 + 30$$

True

False

Why? 6 × 7 is 42, not 43.

Variables and Equations

Write expressions with a variable. Find their values.

Write an expression for the words, or words for the expression.

In words	Expression
Example 5 more than a number n	$n + 5$
1. a number b divided by 4	$b \div 4$
2. 9 less than a number m	$m - 9$
3. e.g. 20 minus a number t	$20 - t$
4. 6 times a number y	$6 \times y$
5. a number p subtracted from 30	$30 - p$
6. e.g. 36 divided by a number d	$36 \div d$
7. the sum of a number k and 14	$k + 14$

Find the value of each expression for each value of n .

Expression	when $n = 4$	when $n = 6$	when $n = 10$
Example $n + 15$	19	21	25
8. $3 \times n$	12	18	30
9. $40 - n$	36	34	30
10. $n \div 2$	2	3	5
11. $2 \times n + 1$	9	13	21

Find the value of each expression when $a = 7$ and $b = 3$.

Example $a \times b = 7 \times 3 = 21$

12. $a + b = 10$

13. $2 \times a + b = 17$

14. $a \times a - b = 46$

Variables and Equations

Put in the value. Write equations and stories.

Is it true for the value given? Circle True or False.

$n = 6$

$a = 12$

Example $n + 9 = 15$ **True** False

4. $50 - a = 38$ **True** False

1. $4 \times n > 20$ **True** False

5. $a \times 3 < 30$ True **False**

2. $30 \div n < 5$ True **False**

6. $a \div 4 > 3$ True **False**

3. $n \times n > 40$ True **False**

7. $2 \times a + 1 = 25$ **True** False

Write an equation with a variable for each story. Then solve.

Example Kai got 18 more marbles. Now he has 45. How many did he have before?

Equation: $m + 18 = 45$

Answer: $m = 27$ marbles

8. 6 cans of juice cost \$18. Each can costs the same. What does one can cost?

Equation: $6 \times c = 18$

Answer: $c = \$3$

9. A rope is cut into 4 equal pieces of 12 feet. How long was the rope?

Equation: $r \div 4 = 12$

Answer: $r = 48$ feet

10. Lena spent \$35 at a fair and has \$40 left. How much did she have before?

Equation: $d - 35 = 40$

Answer: $d = \$75$

Write a story problem for each equation. Then solve it.

11. $b - 14 = 30$

Sample: Ben had some cards. He gave 14 away, and now he has 30. How many cards did he have at first?

Answer: $b = 44$

12. $5 \times p = 40$

Sample: There are 40 pens in 5 packs. Each pack has the same number. How many pens are in each pack?

Answer: $p = 8$

Variables and Equations

Find the rule. Write it as an expression with n .

Find the rule and write it with n . Fill in the missing numbers.

Example

Rule: Out = $n + 7$

In n	3	5	8	10	12
Out	10	12	15	17	19

1. Rule: Out = $n \times 4$

In n	2	3	5	7	9
Out	8	12	20	28	36

2. Rule: Out = $n \div 3$

In n	6	9	15	21	30
Out	2	3	5	7	10

3. Rule: Out = $2 \times n + 1$

In n	1	2	3	4	6
Out	3	5	7	9	13

Add or multiply? Circle one. Then write the rule.

Example

Rule: Out = $n + 5$

In n	1	2	3	4
Out	6	7	8	9

☒ Add
☐ Multiply

4. Rule: Out = $n \times 6$

In n	2	4	6	8
Out	12	24	36	48

☐ Add
☒ Multiply

5. Rule: Out = $n + 10$

In n	3	6	9	12
Out	13	16	19	22

☒ Add
☐ Multiply

6. Rule: Out = $n \times 7$

In n	5	6	7	8
Out	35	42	49	56

☐ Add
☒ Multiply

Use the table to solve the story problem.

7. A ride at a fair costs \$3 for each ticket. Fill in the table. Write an expression for the cost of n tickets. Then find the cost of 12 tickets.

Tickets n	1	2	3	4	5
Cost (\$)	3	6	9	12	15

Cost of n tickets: $n \times 3$

Cost of 12 tickets: \$36