Unit 6

Expressions and Equations

Up until now, an equal sign meant you were being asked to calculate an answer. In this unit, you'll learn about its other meaning: balance. When things are in balance, it becomes possible to know the unknown.

Essential Questions

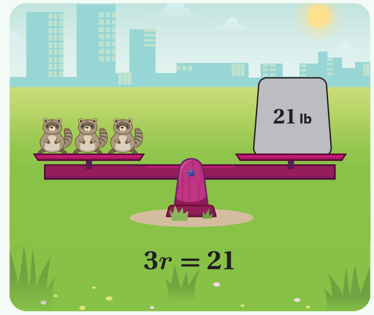
- What does it mean for an equation to be true? Can an equation be false?
- What does it mean for two expressions to be equivalent?
- If multiplication is repeated addition, how do we represent repeated multiplication?

Summary | Lesson 1

You can use seesaws and tape diagrams to represent *equations* and help determine unknown values.

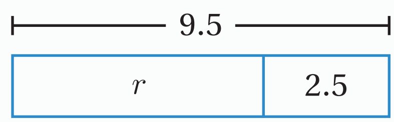
We often use a letter, such as x or a, as a placeholder for an unknown number in tape diagrams and equations. This letter is called a **variable**.

For example, if 3 equal-weight racoons weigh a total of 21 pounds, you can represent the weight of each raccoon with r and write the equation $3r = 21$.



Try This

A raccoon and a 2.5-pound weight balance with a 9.5-pound weight.



Nekeisha drew this tape diagram to help determine the weight of the raccoon.

a Write an equation to represent this situation.

b How much does the raccoon weigh?

Use the equation or tape diagram if it helps with your thinking.

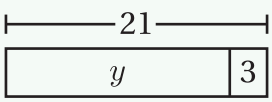
Summary | Lesson 2

A tape diagram can help us visualize an equation and determine its solution. The **solution to an equation** is a value of the variable that makes the equation true.

When we work with an equation that represents a situation, it is important to determine what the variable represents when we determine the solution.

Here is an example.

Emmanuel needed $21 to buy a gift. He had $3 and borrowed the rest from his parents.

Equation	Tape Diagram	Solution to the Equation	Solution's Meaning
$3 + y = 21$		$y = 18$	Emmanuel borrowed $18 from his parents.

Try This

Here is a situation, along with an equation that represents it.

Kiandra sold 4 hats and made $32. The hats cost h dollars each.	$4h = 32$

a Draw a tape diagram to represent this situation.

b Determine the solution to the equation.

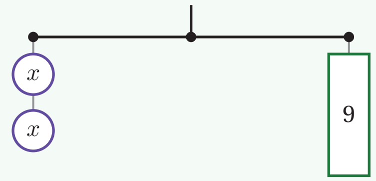
c Explain what the solution means in this situation.

Summary | Lesson 3

Hangers are a helpful way to represent equations. A hanger is balanced when the weight on both sides is equal.

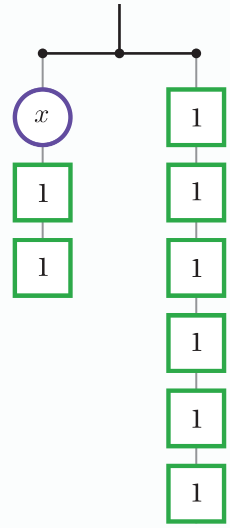
Here is an example.

This hanger represents the equation $2x = 9$, or $x + x = 9$. The solution to this equation is the value of x that will keep the hanger balanced. The solution for this hanger is 4.5 because $4.5 + 4.5 = 9$ or $2(4.5) = 9$.



Try This

Here is a balanced hanger.



a Write an equation to represent this hanger.

b Determine the value of x that balances this hanger.

Summary | Lesson 4

There are many strategies to solve equations, such as drawing models, using number sense to determine the value that makes an equation true, making a hanger balanced, or using inverse operations to isolate a variable.

Here are two examples that use inverse operations to solve an equation.

Equation	Explanation
$x + 1.5 = 3.25$	Original equation
$x + 1.5 - 1.5 = 3.25 - 1.5$	Subtract 1.5 from both sides.
$x = 1.75$	The solution to this equation is 1.75.

Equation	Explanation
$\frac{1}{2}y = 54$	Original equation
$\frac{1}{2}y \div \frac{1}{2} = 54 \div \frac{1}{2}$	Divide both sides by $\frac{1}{2}$.
$y = 108$	The solution to this equation is 108.

Try This

Determine the solution to each equation.

Draw a hanger or a tape diagram if it helps with your thinking.

a $y + 1.8 = 14.7$

b $1.8 = 3t$

Summary | Lesson 5

Writing an equation to match a situation is a helpful tool when trying to determine an unknown value. The equation can be solved using a variety of strategies such as tape diagrams, hangers, or inverse operations. We can check the solution to an equation by substituting the value of the variable to see if it makes the equation true. Once we have a solution to the equation, it's important to determine the meaning of the solution.

Here is an example.

Situation	Equation	Solution	Solution Check	Solution's Meaning
Adah has $42 to spend on music downloads. Each download costs $7. She can buy x downloads.	$7x = 42$	$x = 6$	$7 \bullet 6 = 42$	She can buy 6 music downloads.

Try This

Riders must be at least 3 feet tall to ride the Calculator 3000, a roller coaster at a math-themed amusement park. Mauricio is visiting the park and is $2\frac{1}{4}$ feet tall.

a. Write an equation to determine the number of feet Mauricio must grow, f, to ride the roller coaster.

b. Solve your equation.

c. Explain what the solution represents in this situation.

Summary | Lesson 6

We can use an expression with a variable to represent situations with known and unknown values. Each part in the expression represents a different value in the situation. Here are a few examples.

- The cost of 1 pound of grapes is $\$2.25$. If p represents pounds of grapes, the expression $2.25p$ can be used to calculate the total cost for any number of pounds of grapes. This expression only has one **term**.
- A grocery store adds a $\$10$ fee to the cost of groceries for delivery. If c represents the cost of groceries and 10 represents the delivery cost, the expression $c + 10$ can be used to calculate the total cost for groceries and delivery. This expression has two terms, c and 10.

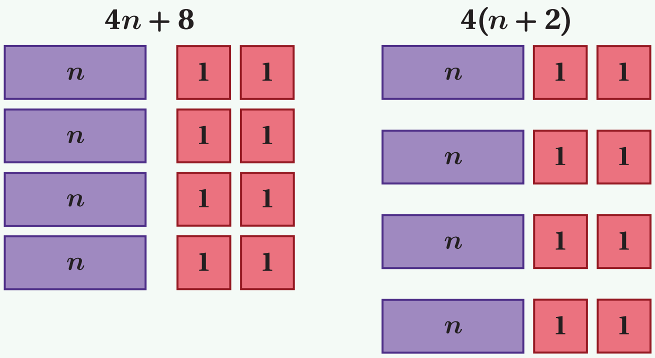
Try This

Mangoes cost $\$1.80$ per pound.

Complete the table to show the cost of other quantities of mangoes.

Mangoes (lb)	Total Cost ($)
1	1.80
2	
5	
10	
p	

Equivalent expressions are expressions that are equal for every value of a variable, such as $4n+8$ and $4(n+2)$. Diagrams that represent these expressions can help us visually decide if the expressions are equivalent.



The diagrams for $4n+8$ and $4(n+2)$ both show 4 n-tiles and 8 one-tiles. Therefore, $4n+8$ and $4(n+2)$ are equivalent expressions because they are equal for every value of n.

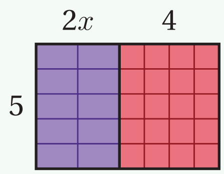
Try This

Complete the table by writing equivalent expressions in each row.

	Expression	Equivalent Expression
a	$6(n+2)$	
b	$5n+15$	
c	$n+n+n+1+1+1$	
d	$(2n+4)+(2n+4)$	

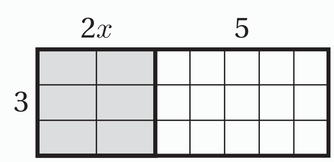
Summary | Lesson 8

You can use areas of rectangles to write equivalent expressions. Two expressions that are equivalent are a *product* expression and a *sum* expression because they refer to the same area. No matter what value you substitute for the variable, the total area is the same.

Area Model	Product of Two Side Lengths	Sum of Two Areas
	$5(2x + 4)$ $10x + 20$	$5 \cdot 2x + 5 \cdot 4$ $10x + 20$

Try This

Write *two* equivalent expressions that represent the area of this rectangle.



Summary | Lesson 9

The expression $8x + 2$ has two terms, and the term $8x$ has a **coefficient** of 8.
The expression $2(x + 1) + 3(2x)$ also has two terms, $2(x + 1)$ and $3(2x)$, but the terms are more complex.

To decide if two expressions are equivalent, you can draw models, substitute values, or rewrite the expressions. If the expressions are equivalent, you can use the distributive property and other operations to rewrite one expression to look like the other.

Here is an example: Determine whether $2(x + 1) + 3(2x)$ is equivalent to $8x + 2$.

$$\begin{aligned} 2(x + 1) + 3(2x) &= 2x + 2 + 6x \\ &= 2x + 6x + 2 \\ &= 8x + 2 \end{aligned}$$

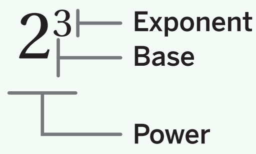
$2(x + 1) + 3(2x)$ and $8x + 2$ are equivalent expressions because after using the distributive property and adding the like terms, the expressions are the same.

Try This

Write an expression that is equivalent to $3(2x) + 4(x + 7)$.

Summary | Lesson 10

Exponents are used to represent repeated multiplication. In the expression 2^n, 2 is the **base**, and n is the **exponent**. If n is a positive whole number, it represents how many times 2 should be multiplied to determine the value of the expression.



Here are some examples.

$2^1 = 2$ $\quad\quad$ $2^3 = 2 \cdot 2 \cdot 2$

There are several different ways to say "2^3."

- "Two to the power of three"
- "Two raised to the power of three"
- "Two to the third power"
- "Two cubed"

Try This

Complete the table.

	Expression With Exponent	Expression Without Exponent	Value
a	3^3		
b		$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$	
c			81

Summary | Lesson 11

There is a specific *order of operations* we use to evaluate expressions with more than one operation, like $5 \cdot 2^4$ or $(5 \cdot 2)^4$.

With Parentheses	**Without Parentheses**
Evaluate the operations in parentheses first:	Evaluate the term with the exponent first:
$(5 \cdot 2)^4$	$5 \cdot 2^4$
$(10)^4$	$5 \cdot (2 \cdot 2 \cdot 2 \cdot 2)$
$10 \cdot 10 \cdot 10 \cdot 10$	$5 \cdot 16$
$10{,}000$	80

Try This

Calculate the value of each expression.

a $7 \cdot 2^3$

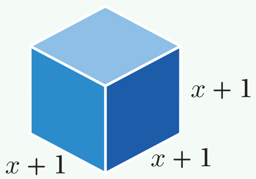
b $27 \cdot \left(\frac{1}{3}\right)^2$

c $\frac{(5-3)^2}{4}$

Summary | Lesson 12

To use the order of operations, *evaluate* the operations in parentheses first. When there are no parentheses, exponents should be evaluated first.

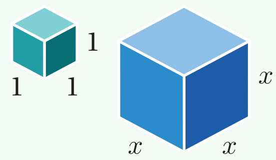
Area is useful for modeling expressions with exponents of 2. Volume is useful for modeling expressions with exponents of 3. When evaluated, these become perfect squares and **perfect cubes**. Here are two examples of expressions evaluated when $x = 2$. Look for the perfect cubes.



$(x + 1)^3$ is

$(2 + 1)^3 = 3^3$

$= 27$



$x^3 + 1$ is

$2^3 + 1 = 8 + 1$

$= 9$

If the exponent is larger than 3, substitute the value of the variable and use the order of operations.

For example, when $x = 2$:

$(x + 1)^4$ is

$(2 + 1)^4 = 3^4$

$= 81$

$x^5 + 1$ is

$2^5 + 1 = 32 + 1$

$= 33$

Try This

Calculate the value of each expression when $x = 2$.

a $x + 3^3$

b $(x + 1)^4$

c $5x^3$

Summary | Lesson 13

Tables and equations can be used to represent and describe a relationship between two variables or quantities.

- The **dependent variable** is the variable in a relationship that is the effect or result.
- The **independent variable** is the variable in a relationship that is the cause. It is used to calculate the value of the dependent variable.

For example, if a boat can travel 36 miles in 3 hours, then:

- The dependent variable is the distance traveled, d.
- The independent variable is the amount of time, t.

Table

t (hr)	d (mi)
3	36
1	12
2	24

The speed of the boat is 12 miles per hour.

Equation

$$d = 12t$$

In 6 hours, the boat will travel $d = 12 \cdot 6 = 72$ miles.

The boat can travel 120 miles in $t = 120 \div 12 = 10$ hours.

Try This

Adah made a table to represent the number of paper cranes she made during a period of time.

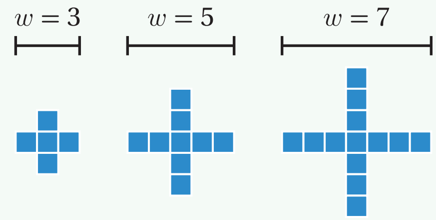
a What is the dependent variable?

b Write an equation to represent this relationship.

Number of Days, d	Number of Paper Cranes, p
1	9
2	18
3	27

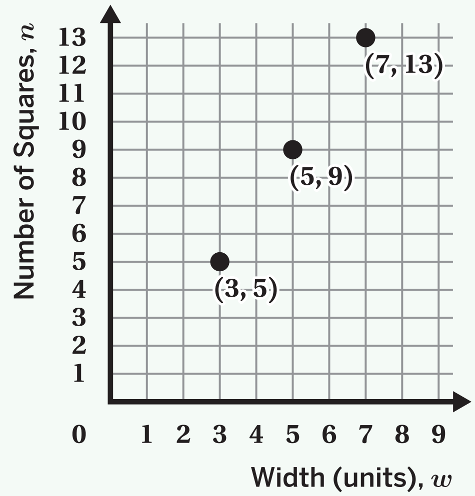
Summary | Lesson 14

Like tables and equations, graphs are another way of representing the relationship between two quantities. For example, in this pattern, the independent variable is the width of the figure, w, and the dependent variable is the number of squares, n.



Here is the table and graph of this relationship.

Width of the Figure (units), w	Number of Squares, n
3	5
5	9
7	13



The numbers in each row of the table indicate an *ordered pair* on the coordinate plane. In the first row of the table, w is 3 and n is 5, which is represented by the point (3, 5) on the graph.

While representing a relationship using a graph, the common practice is to use the x-axis for the independent variable.

Try This

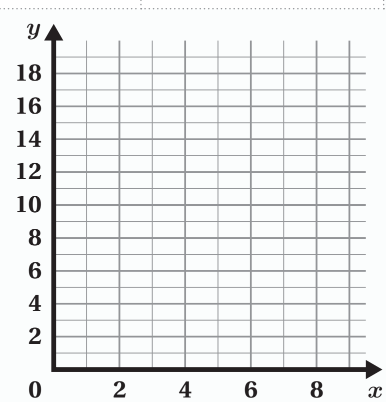
The number of mosquitoes in Kanna's garden keeps increasing!

Kanna made a table to represent the relationship between hours passed, h, and the number of mosquitoes, m, in her garden.

Hours, h	Mosquitoes, m
1	6
2	10
4	18

Use Kanna's table to create a graph of this relationship.

Label each axis with what it represents.



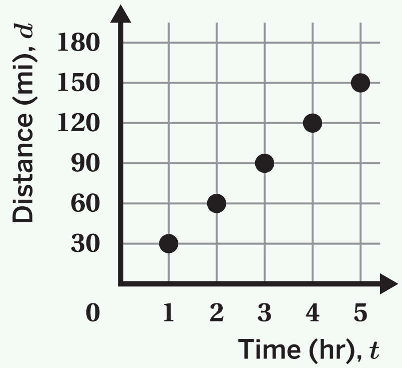
All three representations — tables, equations, and graphs — hold the same mathematical information described in a situation but display it in different ways.

For example, if a car travels 30 miles per hour at a constant speed, you can determine the distance the car traveled in 4 hours using a table, a graph, or an equation.

Table

Time, t (hr)	Distance, d (mi)
1	30
2	60
4	120

Graph



Equation

$d = 30t$

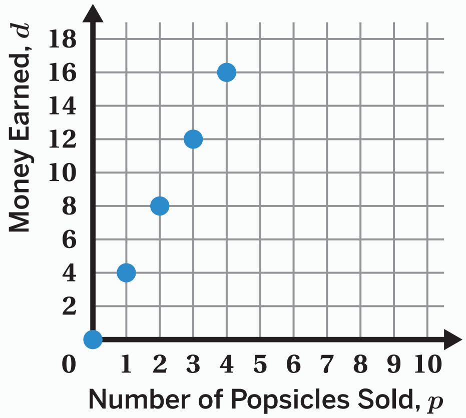
$d = 30(4)$

$d = 120$

In all three representations, we can see that the car traveled 120 miles in 4 hours.

Try This

Here is a graph that shows the money that Jin earned from selling popsicles.



a Create a table that represents this graph.

Number of Popsicles Sold, p	Money Earned, d

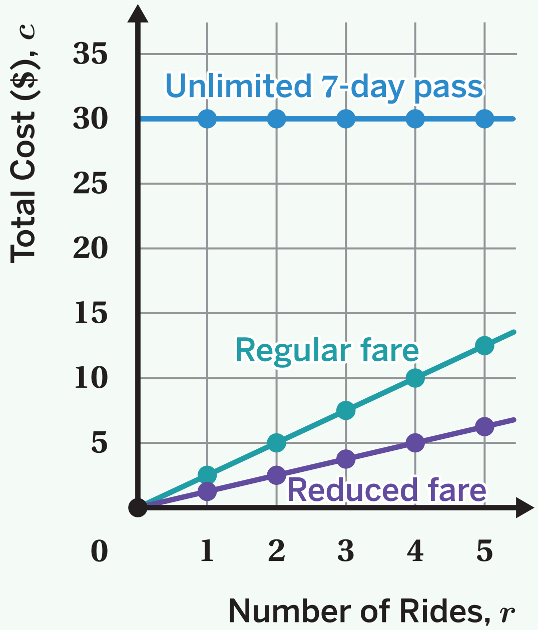
b Write an equation that represents this graph.

Summary | Lesson 16

We can use data in tables, graphs, and equations to help make decisions in real-world situations. When it comes to analyzing subway ticket fares, these representations can help us make informed decisions about what type of transportation ticket to purchase.

Using the graph, we can see that the regular fare ticket is the best choice if we ride 5 times or less and do not qualify for the reduced fare. If we extend each line on the graph, we'll be able to determine when the price of an unlimited 7-day pass will be lower than the regular fare.

We can use these tools to make sure we get the best subway ticket for our needs.



Try This

In 2024, one regular-fare subway ride cost $\$2.90$ in New York City.

a Write an equation to represent the relationship between the total cost, t, and the number of rides, r.

b Use the equation to determine how much 15 rides would cost.

c An unlimited 30-day subway pass costs $\$132$. Explain when it would be a good deal to buy the unlimited monthly pass.

Try This | Answer Key

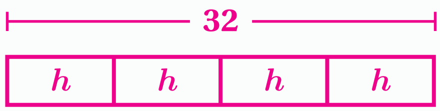
Lesson 1

a $r + 2.5 = 9.5$

b 7 pounds

Lesson 2

a



b $h = 8$

c Each hat costs $8.

Lesson 3

a $x + 2 = 6$

b $x = 4$

Lesson 4

a $y = 12.9$

Explanation: One strategy is to use the inverse operation and subtract 1.8 from both sides of the equation.

b $0.6 = t$

Explanation: One strategy is to use the inverse operation and divide both sides of the equation by 3.

Lesson 5

a $2\frac{1}{4} + f = 3$ (or equivalent)

b $f = \frac{3}{4}$

Explanation: One strategy is to use the inverse operation and subtract $2\frac{1}{4}$ from both sides of the equation. Then you can check the solution by substituting $\frac{3}{4}$ for f: $2\frac{1}{4} + \frac{3}{4} = 3$.

c Mauricio must grow $\frac{3}{4}$ feet (or equivalent) in order to ride the roller coaster.

Lesson 6

Mangoes (lb)	Total Cost ($)
1	1.80
2	**3.60**
5	**9.00**
10	**18.00**
p	**$1.80p$**

Lesson 7

Expression	Equivalent Expression
$6(n+2)$	**$6n+12$ (or equivalent)**
$5n+15$	**$5(n+3)$ (or equivalent)**
$n+n+n+1+1+1$	**$3n+3$ (or equivalent)**
$(2n+4)+(2n+4)$	**$4n+8$ (or equivalent)**

Lesson 8

Responses vary.

a. $3(2x+5)$

b. $6x+15$

Lesson 9

Responses vary. $10x+28$

Explanation: One strategy is to use the distributive property to expand the expressions. Then you can add the like terms. $3(2x)+4(x+7)=6x+4x+28=10x+28$

Lesson 10

Expression With Exponent	Expression Without Exponent	Value
3^3	$3 \cdot 3 \cdot 3$	27
$\left(\frac{1}{2}\right)^4$ (or equivalent)	$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$	$\frac{1}{16}$ (or equivalent)
9^2 (or equivalent)	$9 \cdot 9$ (or equivalent)	81

Lesson 11

a 56

Explanation: Here is one strategy: $7 \cdot 2^3 = 7 \cdot (2 \cdot 2 \cdot 2) = 7 \cdot 8 = 56$

b 3

Explanation: Here is one strategy: $27 \cdot \left(\frac{1}{3}\right)^2 = 27 \cdot \left(\frac{1}{3} \cdot \frac{1}{3}\right) = 27 \cdot \frac{1}{9} = \frac{27}{9} = 3$

c 1

Explanation: Here is one strategy: $\frac{(5-3)^2}{4} = \frac{(2)^2}{4} = \frac{4}{4} = 1$

Lesson 12

a 29

b 81

c 40

Explanation: One strategy is to substitute 2 for x, then use the order of operations.
$5x^3 = 5 \cdot 2^3 = 5 \cdot 8 = 40$

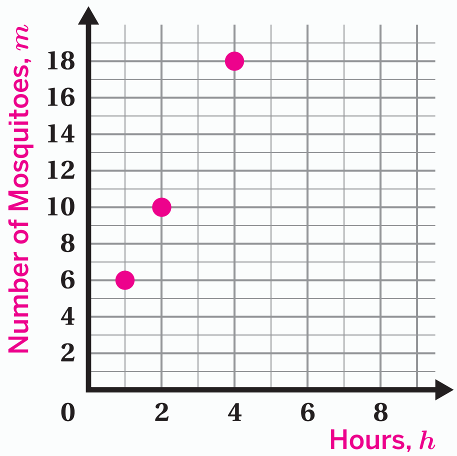
Lesson 13

a Number of paper cranes, p

Explanation: The number of cranes made is dependent upon the number of days.

b $p = 9d$ (or equivalent)

Lesson 14



Lesson 15

a *Responses vary.*

Number of Popsicles Sold, p	Money Earned, d
1	4
2	8
3	12
4	16

b $d = 4p$

Lesson 16

a $t = 2.9r$

b $\$43.50$

Explanation: One strategy is to substitute 15 *for* r*, then solve the equation for* t. $t = 2.9(15) = 43.50$

c *Explanations vary*. The monthly pass would be a good deal if the total cost of all your single-ride tickets is going to be more than $\$132$. You can use the equation to find out how many rides you would need to take. If $132 = 2.9r$, we can divide both sides by 2.9 to solve for r: $\frac{132}{2.9} = \frac{2.9r}{2.9}$ and $45.5 = r$. That means that a rider would start to save money with the monthly pass after 45 rides.

Grade 6 Unit 6 Glossary/6.º grado Unidad 6 Glosario

English

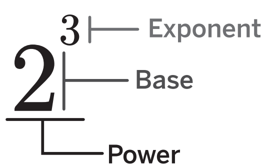
A

associative property The property says $a + (b + c) = (a + b) + c$ and $a \cdot (b \cdot c) = (a \cdot b) \cdot c$. This means that expressions with addition or multiplication have the same sum or product no matter how the numbers in the expression are grouped.

For example, $(2 + 1) + 3 = 2 + (1 + 3)$ and $(3 \cdot 4) \cdot 5 = 3 \cdot (4 \cdot 5)$.

B

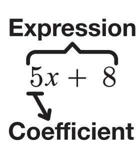
base (of a power) The number that is raised to an exponent. When determining the value of a power, the exponent tells you how many times the base should be multiplied.



In the expression 2^3, 2 is the base.

C

coefficient A number that is multiplied by a variable. Usually, there is no symbol between the coefficient and the variable.



In the expression $5x + 8$, 5 is the coefficient of x.

commutative property The property says $a + b = b + a$ and $a \cdot b = b \cdot a$. This means that expressions with addition or multiplication have the same sum or product no matter what order the numbers are in.

For example, $2 + 1 = 1 + 2$ or $3 \cdot 4 = 4 \cdot 3$.

Español

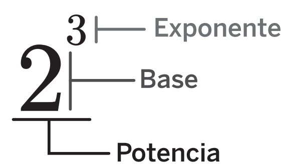
A

propiedad asociativa La propiedad indica que $a + (b + c) = (a + b) + c$ y $a \cdot (b \cdot c) = (a \cdot b) \cdot c$. Esto significa que las expresiones en las que se suma o se multiplica tienen la misma suma o el mismo producto independientemente de cómo se agrupen los números en la expresión.

Por ejemplo, $(2 + 1) + 3 = 2 + (1 + 3)$ y $(3 \cdot 4) \cdot 5 = 3 \cdot (4 \cdot 5)$.

B

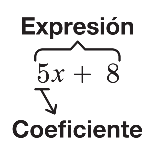
base (de una potencia) El número elevado a un exponente. Al determinar el valor de una potencia, el exponente indica cuántas veces debe multiplicarse la base.



En la expresión 2^3, 2 es la base.

C

coeficiente Un número que se multiplica por una variable. Por lo general, no hay ningún símbolo entre el coeficiente y la variable.



En la expresión $5x + 8$, el coeficiente de x es 5.

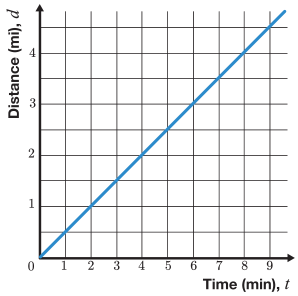
propiedad conmutativa La propiedad indica que $a + b = b + a$ y $a \cdot b = b \cdot a$. Esto significa que las expresiones en las que se suma o se multiplica tienen la misma suma o el mismo producto, independientemente del orden en el que estén los números.

Por ejemplo, $2 + 1 = 1 + 2$ o $3 \cdot 4 = 4 \cdot 3$.

English | Español

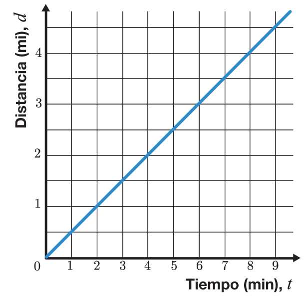
D

dependent variable The variable in a relationship that is the effect or result. The dependent variable is typically on the vertical axis of a graph and in the right-hand column of a table. The other variable in a relationship is called the independent variable.



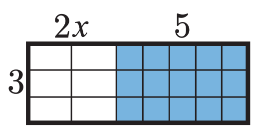
For example, if you are exploring the distance a boat can travel in different amounts of time, the dependent variable is the distance traveled, d.

variable dependiente La variable en una relación que es el efecto o resultado. La variable dependiente suele estar en el eje vertical de una gráfica y en la columna derecha de una tabla. La otra variable en una relación se llama variable independiente.



Por ejemplo, si se está investigando la distancia que puede recorrer un barco en diferentes períodos de tiempo, la variable dependiente es la distancia recorrida, d.

distributive property The property that says $a(b + c) = ab + ac$. This means that multiplying a number by the sum of two or more terms is equal to multiplying the number by each term separately before adding the products together.

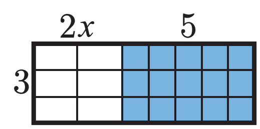


Area as a Product

$3(2x + 5)$

For example, $3(2x + 5) = 3 \cdot 2x + 3 \cdot 5 = 6x + 15$.

propiedad distributiva La propiedad que indica que $a(b + c) = ab + ac$. Significa que multiplicar un número por la suma de dos o más términos equivale a multiplicar el número por cada término individualmente y luego sumar los productos.



El área como un producto

$3(2x + 5)$

Por ejemplo, $3(2x + 5) = 3 \cdot 2x + 3 \cdot 5 = 6x + 15$.

E

equation A mathematical statement made up of two expressions with an equal sign between them.

For example, $6m + 5 = 17$ and $12 - 15 = -3$ are equations, but $2n$ and $x > 5$ are not equations.

ecuación Un enunciado matemático formado por dos expresiones con un signo igual entre ellas.

Por ejemplo, $6m + 5 = 17$ y $12 - 15 = -3$ son ecuaciones, pero $2n$ y $x > 5$ no son ecuaciones.

equivalent expressions Expressions that are equal for every value of a variable.

$x + x + x$ is equivalent to $3x$ because they both describe three copies of an unknown number, x.

expresiones equivalentes Expresiones que son iguales para cualquier valor de una variable.

$x + x + x$ equivale a $3x$ porque ambas describen tres copias de un número desconocido, x.

evaluate To evaluate is to determine a single number that represents an expression's value.

For example, to evaluate $5x + 2$ when $x = 3$, we substitute 3 for x and then calculate $5(3) + 2 = 17$.

evaluar Evaluar significa determinar el número individual que representa el valor de una expresión.

Por ejemplo, para evaluar $5x + 2$ cuando $x = 3$, sustituimos x por 3 y luego calculamos $5(3) + 2 = 17$.

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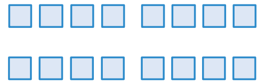
English | **Español**

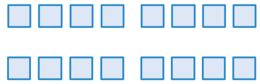
exponent A number used to describe repeated multiplication. Exponents are sometimes called powers.



$$2^4 = 16$$

For example, $2 \cdot 2 \cdot 2 \cdot 2 = 16$ can be represented by the equation $2^4 = 16$, where 4 is the exponent. We can read this equation as “2 to the power of 4 equals 16” or “2 to the fourth equals 16.”

exponente Un número que se usa para describir multiplicaciones repetidas. A los exponentes a veces se les conoce como potencias.



$$2^4 = 16$$

Por ejemplo, $2 \cdot 2 \cdot 2 \cdot 2 = 16$ puede representarse con la ecuación $2^4 = 16$, donde 4 es el exponente. Podemos leer esta ecuación como “2 a la potencia de 4 es igual a 16” o “2 a la cuarta potencia es igual a 16”.

expression A set of numbers, variables, operations, and grouping symbols that represent a quantity.

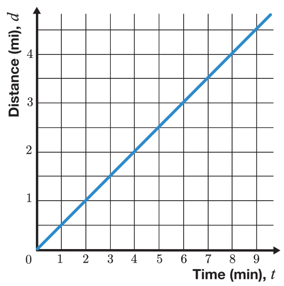
For example, $2n - 8$ and $21 + 37$ are expressions.

expresión Un conjunto de números, variables, operaciones y símbolos de agrupación que representan una cantidad.

Por ejemplo, $2n - 8$ y $21 + 37$ son expresiones.

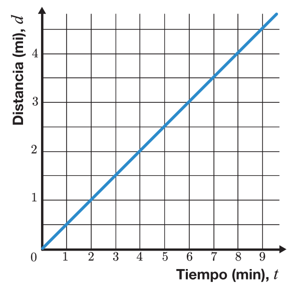
I

independent variable The variable in a relationship that is the cause. The independent variable is typically on the horizontal axis of a graph and in the left-hand column of a table. The other variable in a relationship is called the dependent variable.



For example, if you are exploring the distance a boat can travel in different amounts of time, the independent variable is the time traveled, t.

variable independiente La variable en una relación que es la causa. La variable independiente suele estar en el eje horizontal de una gráfica y en la columna izquierda de una tabla. La otra variable en una relación se llama variable dependiente.



Por ejemplo, si estamos evaluando la distancia que puede recorrer un barco en diferentes cantidades de tiempo, la variable independiente es el tiempo transcurrido, t.

L

like terms Terms with variables and exponents that are the same.

For example, $8x$ and $12x$ are like terms because both terms have a variable of x. $3x$ and $3x^2$ are not like terms because they have different exponents.

términos semejantes Términos con variables y exponentes iguales.

Por ejemplo, $8x$ y $12x$ son términos semejantes porque ambos tienen una variable que incluye x. $3x$ y $3x^2$ no son términos semejantes porque tienen exponentes diferentes.

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O

ordered pair Two values of x and y, written as (x, y), that represent a point on the coordinate plane.

For example, $(3, 5)$ represents the point where $x = 3$ and $y = 5$.

order of operations A consistent order applied to an expression with multiple operations so that the expression is evaluated the same way by everyone. The standard order of operations is parentheses/grouping symbols, exponents/roots, multiplication/division, and then addition/subtraction.

par ordenado Dos valores de x y y, escritos como (x, y), que representan un punto en el plano de coordenadas.

Por ejemplo, $(3, 5)$ representa el punto donde $x = 3$ y $y = 5$.

orden de las operaciones Un orden coherente aplicado a una expresión con múltiples operaciones para que cualquiera pueda evaluar la expresión de la misma manera.El orden estándar de las operaciones es paréntesis/símbolos de agrupación, exponentes/raíces, multiplicación/división y, luego, suma/resta.

P

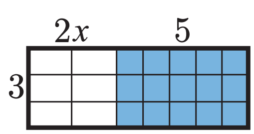
perfect cube The cube of an integer is called a perfect cube.

For example, 27 is a perfect cube because $3 \cdot 3 \cdot 3 = 3^3$ and $3^3 = 27$.

perfect square The square of an integer is called a perfect square.

For example, 49 is a perfect square because $7 \cdot 7 = 7^2$ and $7^2 = 49$.

product The value of two or more quantities when multiplied.



Area as a Product

$3(2x + 5)$

For example, the area of this rectangle is the product of 3 and $2x + 5$ or $3(2x + 5)$.

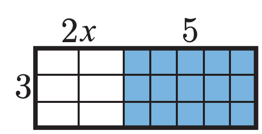
cubo perfecto El cubo de un número entero se llama cubo perfecto.

Por ejemplo, 27 es un cubo perfecto porque $3 \cdot 3 \cdot 3 = 3^3$ y $3^3 = 27$.

cuadrado perfecto El cuadrado de un número entero se llama cuadrado perfecto.

Por ejemplo, 49 es un cuadrado perfecto porque $7 \cdot 7 = 7^2$ y $7^2 = 49$.

producto El valor de dos o más cantidades cuando se multiplican.



El área como un producto

$3(2x + 5)$

Por ejemplo, el área de este rectángulo es el producto de 3 y $2x + 5$ o $3(2x + 5)$.

S

solution to an equation A value of a variable that makes the equation true. "Solving an equation" is any work you do to answer the question "Which values make the equation true?"

$$3x = 15$$
$$x = 5$$
$$3(5) = 15$$

For example, 5 is a solution to the equation $3x = 15$ because $3(5) = 15$ is true. 6 is not a solution to the equation $3x = 15$ because $3(6) = 15$ is not true.

solución de una ecuación Un valor de una variable que hace que la ecuación sea verdadera. "Resolver una ecuación" es cualquier trabajo que se hace para responder la pregunta: "¿Qué valores hacen que la ecuación sea verdadera?".

$$3x = 15$$
$$x = 5$$
$$3(5) = 15$$

Por ejemplo, 5 es una solución de la ecuación $3x = 15$ porque $3(5) = 15$ es verdadero. 6 no es una solución de la ecuación $3x = 15$ porque $3(6) = 15$ no es verdadero.

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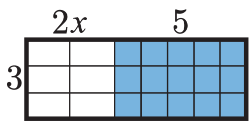
English

substitute To replace a variable with a value or other expression.

$$4x = 4(5)$$
$$= 20$$

In this example, 5 is substituted for x in the expression $4x$.

sum The value of two or more quantities when added together.



Area as a Sum

$$6x + 15$$

For example, the area of this rectangle is the sum of $6x$ and 15, or $6x + 15$.

T

term A part of an expression. A term can be a single number, a variable, or a number and variable multiplied together.

Expression

$$\overbrace{5x + 8}$$

Terms

For example, the expression $5x + 8$ has two terms. The first term is $5x$ and the second term is 8.

U

unit rate A rate that describes how one quantity changes when the other quantity changes by exactly 1 unit.

For example, if 12 people share 3 pizzas equally, then one unit rate is 4 people per pizza. Another unit rate in this situation is $\frac{1}{4}$ pizza per person.

V

variable A letter or symbol that represents a value or set of values.

In the expression $10 - x$, the variable is x.

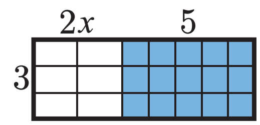
Español

sustituir Reemplazar una variable por un valor u otra expresión.

$$4x = 4(5)$$
$$= 20$$

En este ejemplo, el 5 sustituye a la x en la expresión $4x$.

suma El valor de dos o más cantidades que se suman.



El área como una suma

$$6x + 15$$

Por ejemplo, el área de este rectángulo es la suma de $6x$ y 15, o $6x + 15$.

T

término Una parte de una expresión. Un término puede ser un número individual, una variable, o una variable y un número multiplicados.

Expresión

$$\overbrace{5x + 8}$$

Términos

Por ejemplo, la expresión $5x + 8$ tiene dos términos. El primer término es $5x$ y el segundo término es 8.

U

tasa unitaria Una tasa que describe cómo cambia una cantidad cuando la otra cantidad cambia en exactamente 1 unidad.

Por ejemplo, si 12 personas se reparten 3 pizzas en partes iguales, entonces una tasa unitaria es 4 personas por pizza. Otra tasa unitaria en esta situación es $\frac{1}{4}$ de pizza por persona.

V

variable Una letra o un símbolo que representa un valor o un conjunto de valores.

En la expresión $10 - x$, la variable es x.