Glossary

absolute value

The absolute value, or magnitude, of a number is its distance from zero on a number line.

Example

The absolute value of -3 is the same as the absolute value of 3 because they are both a distance of 3 from zero on a number line.

$|-3| = |3|$

account balance

Amount of money in an account at a given time.

Addition Property of Equality

The Addition Property of Equality states that if two values a and b are equal, when you add the same value c to each, the sums are equal.

Examples

$12 = 12$ and $12 + 7 = 12 + 7$

If $a = b$, then $a + c = b + c$.

additive inverses

Two numbers with the sum of zero are called additive inverses.

Examples

$-19 + 19 = 0$ $\qquad$ $a + -a = 0$

additive reasoning

Additive reasoning focuses on the use of addition and subtraction for comparisons.

Examples

Vicki is 40 years old and Ben is 10 years old. In 5 years, Vicki will be 45 and Ben will be 15. Vicki will always be 30 years older than Ben. This is additive reasoning.

algebraic expression

An algebraic expression is a mathematical phrase that has at least one variable, and it can contain numbers and operation symbols.

Examples

a $\qquad$ $2a + b$ $\qquad$ xy $\qquad$ $\frac{4}{p}$ $\qquad$ z^2

algorithm

An algorithm is a process or description of steps you can follow to complete a mathematical calculation.

Annual Percentage Yield (APY)

Annual Percentage Yield (APY) is a percentage that is paid to customers based on the account balance in an account for a year.

Example

For example, Yvonne opens a checking account with an average monthly balance of $600. The account has a 2.5% APY.

$(600)(0.025) = 15$

Yvonne will earn $15 on this checking account over the course of the year.

associate's degree

An associate's degree is a degree earned in a one-or two-year program in which students learn a specific skill or trade.
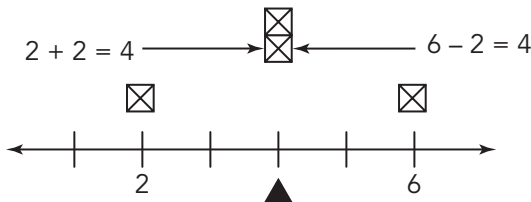
--- B ---

balance point

When you have all the points on a number line at the same value, the number line is balanced. The value where the number line is balanced is called the balance point.

Example
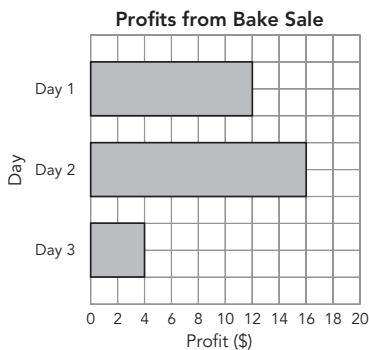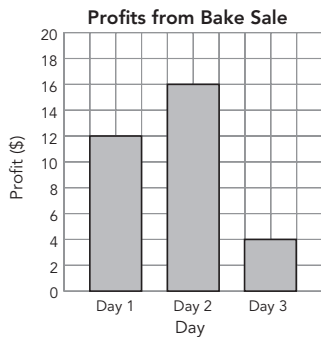
Consider the data set: 2, 6.

$2 + 2 = 4$ ⟶ ⟵ $6 - 2 = 4$

The balance point is 4.

bar graph

A bar graph displays categorical data using either horizontal or vertical bars on a graph. The height or length of each bar indicates the value for that category.
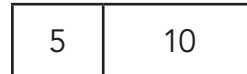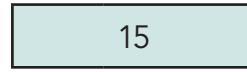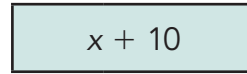
Examples

Profits from Bake Sale

Profits from Bake Sale

bar model

A bar model uses rectangular bars to represent known and unknown quantities.

Example

You can use a bar model to solve the equation $x + 10 = 15$.

| x | 10 |

| $x + 10$ |

| 15 |

| 5 | 10 |

The top bar can be split into two bars, x and 10. When this split happens in the bottom bar, with one bar containing 10, it shows that x is the same as 5, so $x = 5$.

base

The base of a power is the factor that is multiplied repeatedly in the power.

Examples

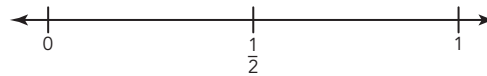$$2^3 = 2 \times 2 \times 2 = 8 \qquad 8^0 = 1$$

↑ base   ↑ base

benchmark fractions

Benchmark fractions are common fractions you can use to estimate the value of fractions.

Example

The numbers 0, $\frac{1}{2}$, and 1 are some benchmark fractions.

benchmark percents

A benchmark percent is a percent that is commonly used, such as 1%, 5%, 10%, 25%, 50%, and 100%.

box-and-whisker plot

A box-and-whisker plot, or just box plot, is a graph that displays the five-number summary of a data set: the median, the upper and lower quartiles (Q1 and Q3), and the minimum and maximum values.

Example

Data: 32, 35, 35, 53, 55, 60, 60, 61, 61, 74, 74

Minimum = 32

Q1 = 35

Median = 60

Q3 = 61

Maximum = 74

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categorical data

Categorical data, or qualitative data, are data for which each piece of data fits into exactly one of several different groups or categories.

Examples

Animals: lions, tigers, bears, etc.

Colors: blue, green, red, etc.

check

A check is a written order to a bank to pay a specific amount of money to a person or company out of your checking account.

Example

| Bank Routing Number | Bank Account Number | Check Number |

checking account

A checking account allows customers to safely store money in the bank and write checks.

circle graph

A circle graph, often called a pie chart, displays categorical data using sectors, or "wedges," of a circle.

Example

Favorite Ways to Travel
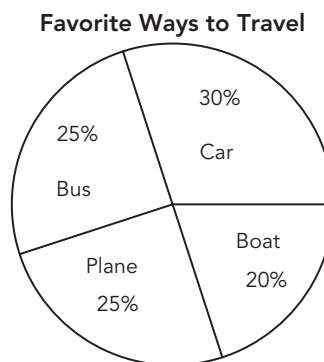
clusters

Clusters are areas of the graph where data are grouped close together.

Example

Number of Pets
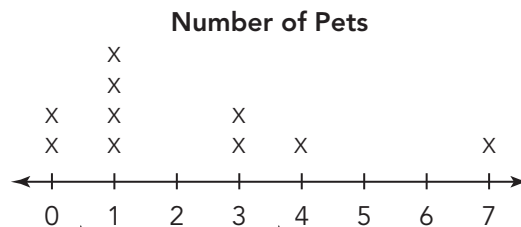
There are clusters of data from 0 to 1 and from 3 to 4.

coefficient

A number that is multiplied by a variable in an algebraic expression is called a coefficient.

Examples

$14x$ $\qquad$ $\frac{1}{3}(g)$ $\qquad$ $w + 2.5$

coefficient $\qquad$ The coefficient is 1 even though it is not shown.

common factor

A common factor is a number that is a factor of two or more numbers.

Example

factors of 60: **1**, **2**, **3**, **4**, 5, **6**, 10, **12**, 15, 20, 30, 60

factors of 24: 1, **2**, **3**, **4**, **6**, 8, **12**, 24

common factors of 60 and 24: 1, 2, 3, 4, 6, and 12

Commutative Property of Multiplication

The Commutative Property of Multiplication states that for any numbers a and b, the product $a \cdot b$ is equal to the product $b \cdot a$.

Examples

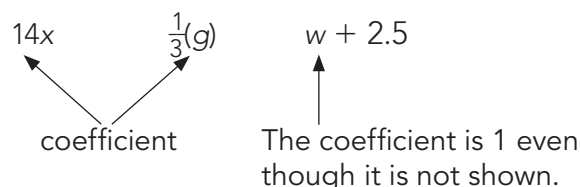$$\begin{array}{c} 29 \\ \times\ 3 \\ \hline 87 \end{array} = \begin{array}{c} 3 \\ \times\ 29 \\ \hline 27 \\ +\ 60 \\ \hline 87 \end{array} \qquad \frac{1}{5} \times \frac{2}{3} = \frac{2}{3} \times \frac{1}{5}$$

$$\frac{2}{15} \qquad \frac{2}{15}$$

complex fraction

A complex fraction is a fraction that has a fraction in either the numerator, the denominator, or both the numerator and denominator.

Examples

$\dfrac{\frac{3}{4}}{3}, \dfrac{\frac{7}{1}}{2}$, and $\dfrac{\frac{1}{4}}{\frac{2}{3}}$ are all complex fractions.

composite solid

A composite solid is made up of more than one geometric solid.

Example
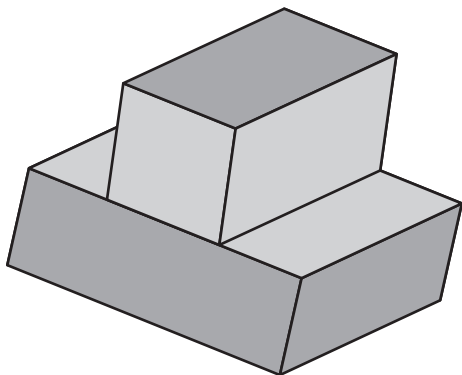
continuous data

When quantitative data are a measurement of something and can have values that are between two counting numbers, the data are called continuous data.

continuous graph

A continuous graph is a graph with no breaks in it.

Examples
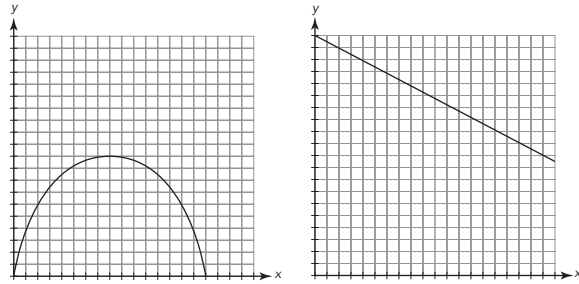
convert

To convert a measurement means to change it to an equivalent measurement in different units.

Example

To convert 36 inches to feet, you can multiply:

$$36 \ \cancel{in.} \left(\frac{1 \ ft}{12 \ \cancel{in.}} \right) = \frac{36 \ ft}{12}$$

$$= 3 ft$$

credit card

A card that allows a person to borrow a certain amount of money and pay the borrowed money back at a later time.

credit history

Credit history includes a record of all loans, credit card debt, late payments etc.

credit report

A credit report is a detailed listing of an individual's credit history.

credit score

A credit score is a number used by lenders to rate how likely it is that a person will repay their debts.

cube

A cube is a polyhedron that has congruent squares as faces.

Example

——————— D ———————

data

Data are categories, numbers, or observations gathered in response to a statistical question.

Examples

favorite foods of sixth graders,
heights of different animals at the zoo

debit

A debit occurs when money is taken out of the account automatically through the use of a debit card.

debit card

A card that allows a bank's customer to pay for goods using money from their account.

Density Property

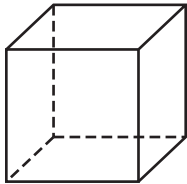The Density Property states that between any two rational numbers there is another rational number.

dependent quantity

The dependent quantity is the quantity that depends on another in a problem situation.

Example

Max just got a new hybrid car that averages 51 miles to the gallon. How far does the car travel on 15 gallons of fuel?

number of gallons $\cdot \frac{\text{miles}}{\text{gallon}} =$ miles traveled

The dependent quantity is the total miles traveled. The number of miles traveled depends on the gallons of fuel.

dependent variable

The variable that represents the dependent quantity is called the dependent variable.

Example

Max just got a new hybrid car that averages 51 miles to the gallon. How far does the car travel on 15 gallons of fuel?

number of gallons $\cdot \frac{\text{miles}}{\text{gallon}} =$ miles traveled

$$g \cdot m = t$$

The dependent quantity is the total miles traveled. Since t represents total miles traveled in the equation, t is the dependent variable.

deposit

A deposit is money put into the account. Deposits may come in the form of cash, checks, or transfers.

discrete data

Discrete data can only take on specific, individual values. Common examples of discrete data include the number of students in a class or shoe sizes.

discrete graph

A discrete graph is a graph of isolated points.

Examples
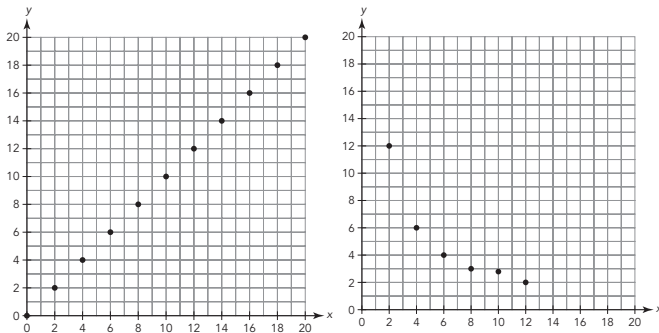
distribution

The overall shape of a graph is called the distribution of data. A distribution is the way in which the data are spread out.

Distributive Property

The Distributive Property states that for any numbers *a*, *b*, and *c*, $a(b + c) = ab + ac$.

Examples

$$4(2 + 15) = 4 \cdot 2 + 4 \cdot 15$$
$$= 8 + 60$$
$$= 68$$

Division Property of Equality

The Division Property of Equality states that when you divide equal values *a* and *b* by the same value *c* and $c \neq 0$, the quotients are equal.

Examples

$12 = 12$ and $12 \div 7 = 12 \div 7$

If $a = b$ and $c \neq 0$, then $\frac{a}{c} = \frac{b}{c}$.

dot plot

A dot plot (sometimes called a line plot) is a data display that shows discrete data on a number line with dots, Xs, or other symbols.

Example
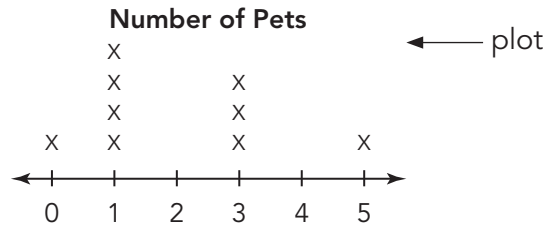
double bar graph

A double bar graph is used when each category contains two different data sets. The bars may be vertical or horizontal.

Example

double number line

A double number line is a model that is made up of two number lines used together to represent the ratio between two quantities.

Example

edge

An edge is the intersection of two faces of a three-dimensional figure.

Example

ellipsis

An ellipsis is a set of three periods used to represent infinity in a number set.

Example

$$\{..., -2, -1, 0, 1, 2, ...\}$$
$$\uparrow \qquad\qquad\qquad \uparrow$$
ellipsis   ellipsis

equation

An equation is a mathematical sentence that uses an equals sign to show that two quantities are the same as one another.

Examples

$$y = 2x + 4$$
$$6 = 3 + 3$$
$$2(8) = 26 - 10$$
$$\frac{1}{4} \cdot 4 = \frac{8}{4} - \frac{4}{4}$$

equivalent expressions

Two algebraic expressions are equivalent expressions if, when any values are substituted for variables, the results are equal.

Example

$$(x + 10) + (6x - 5) = 7x + 5$$
$$12 + 7 = 14 + 5$$
$$19 = 19$$

equivalent fractions

Fractions that represent the same part-to-whole relationship are equivalent fractions.

equivalent ratios

Equivalent ratios are ratios that represent the same part-to-part or part-to-whole relationship.

evaluate an algebraic expression

To evaluate an algebraic expression means to determine the value of the expression for a given value of each variable.

Example

Evaluate the expression $\frac{4x + (2^3 - y)}{p}$ for $x = 2.5$, $y = 8$, and $p = 2$.

- First replace the variables with numbers: $\frac{4(2.5) + (2^3 - 8)}{2}$
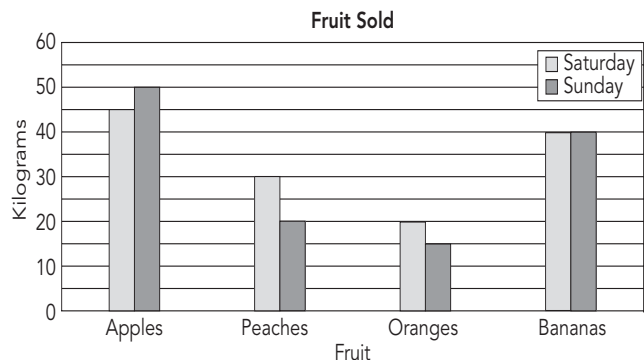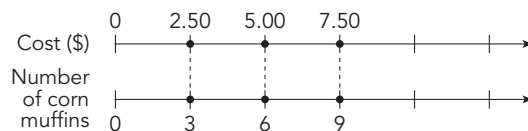- Then calculate the value of the expression: $\frac{10 + 0}{2} = \frac{10}{2} = 5$.

evaluate a numeric expression

To evaluate a numeric expression means to rewrite the expression as a single numeric value.

Example

$$19 - 4 \times 3$$
$$19 - 12$$
$$7$$

experiment (statistics)

An experiment is one method of collecting data in which a researcher imposes a condition and observes the results.

Example

A researcher conducts an experiment to investigate if 6th graders perform better on an assessment if they read a textbook or watch a video about the material. The researcher randomly assigns half the students to read the text and half the students to watch the video. All students would be given the same assessment and the scores of the students in the two groups would be compared.

exponent

The exponent of the power is the number of times the base is used as a factor.

Examples

$2^3 = 2 \times 2 \times 2$

↑
exponent

$8^4 = 8 \times 8 \times 8 \times 8$

↑
exponent

— F —

face

A face is one of the polygons that makes up a polyhedron.

Example

face

frequency

A frequency is the number of times an item or number occurs in a data set.

Example

Number Rolled	Tally	Frequency
2	IIII II	7

The number 2 was rolled 7 times, so its frequency was 7.

frequency table

A table used to organize data according to how many times a data value occurs.

Example

Number of Roller Coasters at Major Theme Parks	
Number of Roller Coasters	Frequency (f)
7–9	6
10–12	4
13–15	7
16–18	2

— G —

gaps

Gaps are areas of the graph where there are no data.

Example

Number of Pets

There are gaps between 1 and 3 and between 4 and 7.

geometric solid

A geometric solid is a bounded three-dimensional geometric figure.

Example

grant

A grant is money awarded to a person from the government or school to help pay tuition.

graph of an inequality

The graph of an inequality in one variable is the set of all points on a number line that make the inequality true.

Example

$x \leq 3$

greatest common factor (GCF)

The greatest common factor, or GCF, is the largest factor two or more numbers have in common.

Example

factors of 16: **1**, **2**, **4**, 8, 16

factors of 12: **1**, **2**, 3, **4**, 6, 12

common factors: 1, 2, 4

greatest common factor: 4

histogram

A histogram is a graphical way to display quantitative or numerical data using vertical bars. The width of a bar represents an interval of data and is often referred to as a bin. The height of the bar indicates the frequency, or the number of data values included in any given bin.

Example
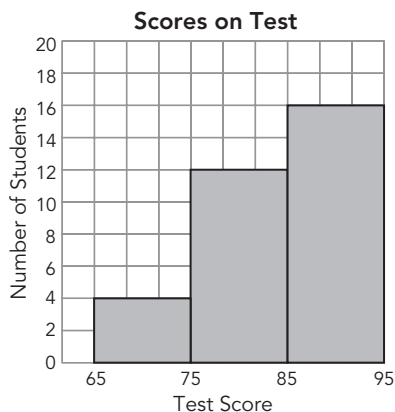
Identity Property of Addition

The Identity Property of Addition states that the sum of any number and 0 is the number.

Examples

$6 + 0 = 6 \qquad \frac{3}{4} + 0 = \frac{3}{4}$

$5^2 + 0 = 5^2 \qquad 0.125 + 0 = 0.125$

Identity Property of Multiplication

The Identity Property of Multiplication states that the product of any number and 1 is the number.

Examples

$6 \times 1 = 6 \qquad \frac{3}{4} \times 1 = \frac{3}{4}$

$5^2 \cdot 1 = 5^2 \qquad 0.125(1) = 0.125$

independent quantity

The independent quantity is the quantity the dependent quantity depends on.

Example

Max just got a new hybrid car that averages 51 miles to the gallon. How far does the car travel on 15 gallons of fuel?

number of gallons $\cdot \frac{\text{miles}}{\text{gallon}} = $ miles traveled

The independent quantity is the number of gallons. The other quantity (miles traveled) is dependent upon this quantity.

independent variable

The variable that represents the independent quantity is called the independent variable.

Example

Max just got a new hybrid car that averages 51 miles to the gallon. How far does the car travel on 15 gallons of fuel?

number of gallons $\cdot \frac{\text{miles}}{\text{gallon}} = $ miles traveled

$$g \cdot m = t$$

The independent quantity is the number of gallons. Since g represents the number of gallons in the equation, g is the independent variable.

inequality

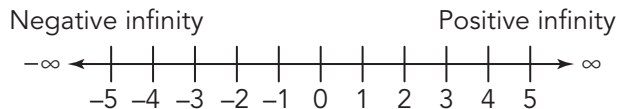An inequality is any mathematical sentence that has an inequality symbol.

Examples

$8 > 2$ $\qquad a \le b \qquad$ $6.051 > 6.009 \qquad$ $2x + 4 \ge 16$

infinity

Infinity, represented by the symbol ∞, means a quantity with no end or bound.

Example

Negative infinity   Positive infinity

integers

Integers are the set of whole numbers with their opposites.

Example

The set of integers can be represented as $\{\dots -3, -2, -1, 0, 1, 2, 3, \dots\}$

interest

Interest is an additional charge for borrowing money, usually a percentage of the amount borrowed.

interest rate

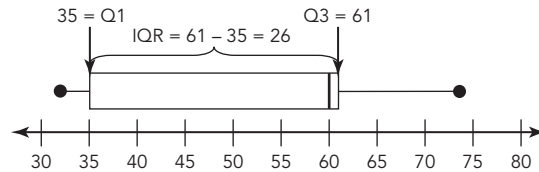The interest rate is the percentage of the balance on the credit card that is added to the cost of the purchase.

interquartile range (IQR)

The interquartile range, abbreviated IQR, is the difference between the third quartile, Q3, and the first quartile, Q1. The IQR indicates the range of the middle 50 percent of the data.

Example

inverse operations

Inverse operations are pairs of operations that reverse the effects of each other.

Examples

Addition and subtraction are inverse operations: $351 + 25 - 25 = 351$.

Multiplication and division are inverse operations: $351 \times 25 \div 25 = 351$.
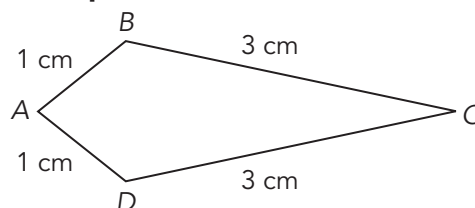
--- K ---

key

A key explains how each data set is represented by a color or a pattern in the graph.

kite

A kite is a quadrilateral with two pairs of consecutive congruent sides where opposite sides are not congruent.

Example

— L —

least common multiple (LCM)

The least common multiple, or LCM, is the smallest multiple (other than zero) that two or more numbers have in common.

Example

multiples of 60: 60, **120**, 180, **240**, 300, 360, 420, 480 . . .

multiples of 24: 24, 48, 72, 96, **120**, 144, 168, 192, 216, **240** . . .

some common multiples of 60 and 24: 120, 240 . . .

least common multiple of 60 and 24: 120

like terms

In an algebraic expression, like terms are two or more terms that have the same variable raised to the same power.

Examples

like terms

$4x + 3p + x + 2 = 5x + 3p + 2$

like terms

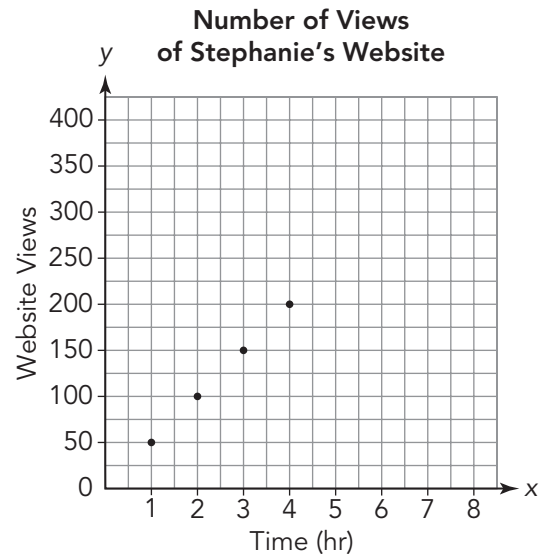$24a^2 + 2a - 9a^2 = 13a^2 + 2a$

no like terms
$m + m^2 - x + x^3$

linear relationship

When a set of points graphed on a coordinate plane forms a straight line, a linear relationship exists.

Example

The points graphed show a linear relationship.

literal equation

A literal equation is an equation in which the variables represent specific measures.

Examples

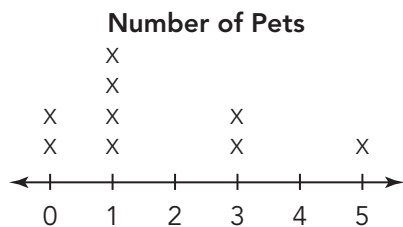$A = lw$ $A = \frac{1}{2} bh$ $d = rt$

master's degree

A master's degree is a one- or two-year degree beyond an undergraduate degree.

mean

The mean is the arithmetic average of the numbers in a data set.

Example

Number of Pets

```
      X
      X
X     X           X
X     X           X           X
←──┼───┼───┼───┼───┼───┼──→
   0   1   2   3   4   5
```

$$\text{Mean} = \frac{0 + 0 + 1 + 1 + 1 + 1 + 3 + 3 + 5}{9}$$
$$= \frac{15}{9} = 1\frac{2}{3} \text{ pets}$$

measure of center

A measure of center tells you how the data values are clustered, or where the "center" of a graph of the data is located.

Examples

Mean, median, and mode are each a measure of center for data.

measure of variation

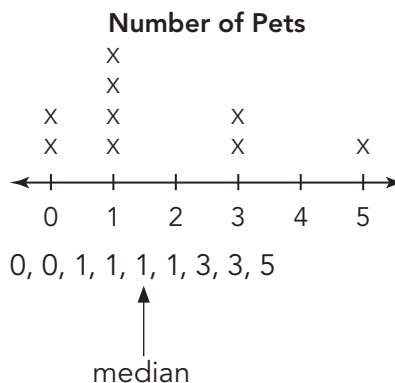A measure of variation describes the spread of data values.

Example

Range is a measure of variation for data.

median

The median is the middle number in a data set when the values are placed in order from least to greatest or greatest to least.
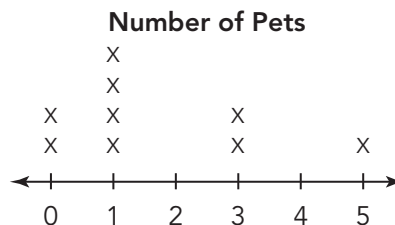
Example

Number of Pets

```
      X
      X
X     X           X
X     X           X           X
←──┼───┼───┼───┼───┼───┼──→
   0   1   2   3   4   5
```

0, 0, 1, 1, 1, 1, 3, 3, 5
↑
median

mode

The mode is the value or values that occur most frequently in a data set.

Example

Number of Pets

```
      X
      X
X     X           X
X     X           X           X
←──┼───┼───┼───┼───┼───┼──→
   0   1   2   3   4   5
```
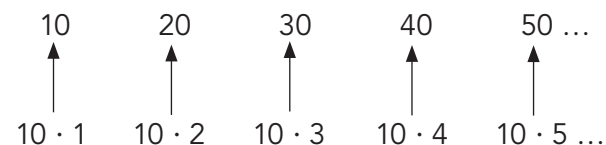
0, 0, 1, 1, 1, 1, 3, 3, 5

The mode of the data is 1.

multiple

A multiple is the product of a given whole number and another whole number.

Example

multiples of 10:

10	20	30	40	50 …
↑	↑	↑	↑	↑
$10 \cdot 1$	$10 \cdot 2$	$10 \cdot 3$	$10 \cdot 4$	$10 \cdot 5$ …

Multiplication Property of Equality

The Multiplication Property of Equality states that if two values *a* and *b* are equal, when you multiply each by the same value *c*, the products are equal.

Examples

$12 = 12$ and $12(7) = 12(7)$

If $a = b$, then $ac = bc$.

multiplicative inverse

The multiplicative inverse of a number $\frac{a}{b}$ is the number $\frac{b}{a}$, where *a* and *b* are nonzero numbers. The product of any nonzero number and its multiplicative inverse is 1.

Examples

The multiplicative inverse of $\frac{3}{7}$ is $\frac{7}{3}$: $\frac{3}{7} \times \frac{7}{3} = \frac{21}{21} = 1$

The multiplicative inverse of 5 is $\frac{1}{5}$: $\frac{5}{1} \times \frac{1}{5} = \frac{5}{5} = 1$

multiplicative reasoning

Multiplicative reasoning focuses on the use of multiplication and division.

Example

Vicki is 40 years old and Ben is 10 years old. Vicki is 4 times as old as Ben. In 5 years, Vicki will be 3 times as old as Ben.
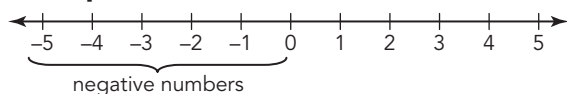
This is multiplicative reasoning.

N

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negative numbers

The values to the left of zero on a number line are called negative numbers.

Example

numeric expression

A numeric expression is a mathematical phrase that contains numbers and operations.

Example

$5 \times 4 - 9$

O

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observational study

An observational study is one method of collecting data in which a researcher collects data by observing the variable of interest.

Example

A researcher is interested in whether or not more men or women prefer a certain store. The researcher observes the number of men and women who visit the store over a number of hours and compares the values of the two groups.

one-step equation

A one-step equation is an equation that can be solved using only one operation.

Order of Operations

The Order of Operations is a set of rules that ensures the same result every time an expression is evaluated.

Example

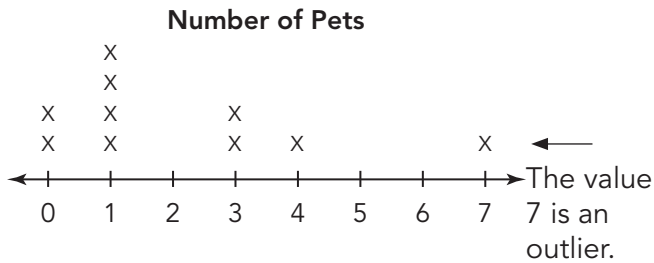$44 + (6 - 5) - 2 \times 75 \div 5^1$ Parentheses

$44 + 1 - 2 \times 75 \div 5^1$ Exponents

$44 + 1 - 2 \times 75 \div 5$ Multiplication and Division (from left to right)

$44 + 1 - 150 \div 5$

$44 + 1 - 30$ Addition and Subtraction (from left to right)

$45 - 30$

15

outliers

Outliers are data values that lie a large distance from the other data in a graph. Outliers usually accompany gaps in data.

Example

Number of Pets

The value 7 is an outlier.

overdraft

An overdraft occurs when money is withdrawn from a bank account and the balance goes below zero. Most banks will charge a fee every time this happens.

—————————— P ——————————

parallelogram

A parallelogram is a four-sided figure with two pairs of parallel sides and opposite sides that are equal in length.

Examples

In parallelogram *ABCD*, opposite sides *AB* and *CD* are parallel and equal in length; opposite sides *AD* and *BC* are parallel and equal in length.

In parallelogram *EFGH*, opposite sides *EF* and *GH* are parallel and equal in length; opposite sides *FG* and *EH* are parallel and equal in length.
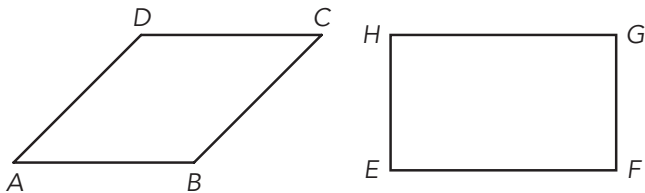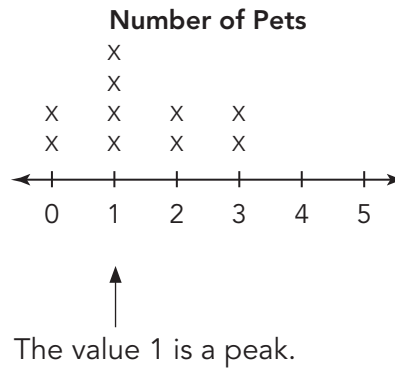

peaks

Peaks are values on a graph that contain more data points than the values on either side of it.

Example

Number of Pets

The value 1 is a peak.

## percent

A percent is a part-to-whole ratio where the whole is equal to 100. Percent is another name for hundredths. The percent symbol "%" means "per 100," or "out of 100."

percent bar graph

A percent bar graph shows a single bar that represents 100%, with sections that represent the frequency of each category. You can display a percent bar graph horizontally or vertically.

Example
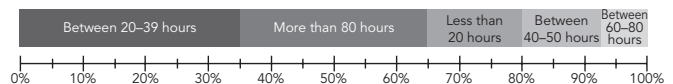
perfect cube

A perfect cube is the cube of an integer.

Example

64 is a perfect cube: $4 \times 4 \times 4 = 64$

perfect square

A perfect square is the square of an integer.

Examples

9 is a perfect square: $3 \times 3 = 9$
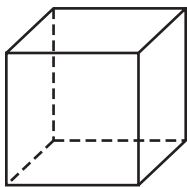
25 is a perfect square: $5 \times 5 = 25$

polyhedron

A polyhedron is a three-dimensional solid figure that has polygons as faces.

Example

A cube is a polyhedron. It has six square faces.

population

A population is an entire set of items from which data are collected.

Example

If you wanted to determine the average height of the students at your school, the number of students at the school would be the population.

post-secondary education

Post-secondary education refers to education beyond high school.

power

A power has two elements: the base and the exponent.

Example

base $\longrightarrow 6^2 \longleftarrow$ exponent

power

private school

Colleges and universities are either public or private. A private school does not receive funding from the state. They raise funds from tuition and donations.

Properties of Inequalities

The Properties of Inequalities allow you to solve inequalities involving any numbers.

Examples

- Addition Property of Inequalities
  If $a < b$, then $a + c < b + c$.
  If $a > b$, then $a + c > b + c$.
- Subtraction Property of Inequalities
  If $a < b$, then $a - c < b - c$.
  If $a > b$, then $a - c > b - c$.
- Multiplication Property of Inequalities
  If $a < b$, then $a \cdot c < b \cdot c$, for $c > 0$.
  If $a > b$, then $a \cdot c > b \cdot c$, for $c > 0$.

  If $a < b$, then $a \cdot c > b \cdot c$, for $c < 0$.
  If $a > b$, then $a \cdot c < b \cdot c$, for $c < 0$.
- Division Property of Inequalities
  If $a < b$, then $\frac{a}{c} < \frac{b}{c}$, for $c > 0$.
  If $a > b$, then $\frac{a}{c} > \frac{b}{c}$, for $c > 0$.
  If $a < b$, then $\frac{a}{c} > \frac{b}{c}$, for $c < 0$.
  If $a > b$, then $\frac{a}{c} < \frac{b}{c}$, for $c < 0$.

proportion

A proportion is an equation that states that two ratios are equal.

Example

$\frac{1}{2} = \frac{4.5}{9}$

public school

Colleges and universities are either public or private. A public school receives funding from the state government to offset the costs of running the university. The tuition to public universities is generally much less than the tuition to private schools.

--- Q ---

quadrants

The *x*- and *y*-axes divide the coordinate plane into four regions called quadrants. These quadrants are numbered with Roman numerals from one (I) to four (IV), starting in the upper right-hand quadrant and moving counterclockwise.

Example

quantitative data

Quantitative data, or numerical data, are data for which each piece of data can be placed on a numerical scale and compared.

Examples

The zoo has 4 lions, 3 tigers, and 6 bears.

In 2006, Los Angeles had a population of about 3,849,378. In the same year, Atlanta had a population of about 429,500.

quartiles

Quartiles are a set of values that describe variation in a data set. When data in a set are arranged in order, quartiles are the numbers that split data into quarters (or fourths).

Example

first quartile (Q1)   third quartile (Q3)

Data: 32, 35, 35, 53, 55, 60, 60, 61, 61, 74, 74

second quartile/median (Q2)

--- R ---

range

The range is the difference between the maximum and minimum values of a data set.

Example

Number of Pets

0, 0, 1, 1, 1, 1, 3, 3, 5

$5 - 0 = 5$

The range of the data is 5.

rate

A rate is a ratio that compares two quantities that are measured in different units.

Example

The speed of 60 miles in two hours is a rate:

$$\frac{60 \text{ mi}}{2 \text{ h}} = \frac{30 \text{ mi}}{1 \text{ h}}$$

ratio

A ratio is a comparison of two quantities that uses division.

Examples

The ratio of stars to circles is $\frac{3}{2}$, or 3:2, or 3 to 2.

The ratio of circles to stars is $\frac{2}{3}$, or 2:3, or 2 to 3.

rational numbers

Rational numbers are the set of numbers that can be written as $\frac{a}{b}$, where a and b are integers and $b \neq 0$.

Examples

-4, $\frac{1}{2}$, $\frac{2}{3}$, 0.67, and $\frac{22}{7}$ are examples of rational numbers.

reciprocal

The reciprocal of a number is also known as the multiplicative inverse of the number. (See *multiplicative inverse*.)

Examples

The reciprocal of $\frac{3}{7}$ is $\frac{7}{3}$: $\frac{3}{7} \times \frac{7}{3} = \frac{21}{21} = 1$

The reciprocal of 5 is $\frac{1}{5}$: $\frac{5}{1} \times \frac{1}{5} = \frac{5}{5} = 1$

Reflexive Property of Equality

The Reflexive Property of Equality says that when both sides of an equation look exactly the same, their values are equal.

Examples

$7 = 7$

$a = a$

relative frequency table

A relative frequency table displays the ratio or percent of occurrences within a category to the total of the category.

Example

Test Scores for Mr. Watson's Math Test		
Test Score	Frequency	Relative Frequency
61–70	4	$\frac{4}{28} \approx 0.143 = 14.3\%$
71–80	7	$\frac{7}{28} = 0.25 = 25\%$
81–90	9	$\frac{9}{28} \approx 0.321 = 32.1\%$
91–100	8	$\frac{8}{28} \approx 0.286 = 28.6\%$

relatively prime

Two numbers that do not have any common factors other than 1 are called relatively prime.

Examples

Positive whole number pairs that have a difference of 1 (4 and 5, 10 and 11, 15 and 16) are always relatively prime.

repeating decimal

A repeating decimal is a decimal in which a digit, or a group of digits, repeat(s) infinitely. Repeating decimals are rational numbers.

Examples

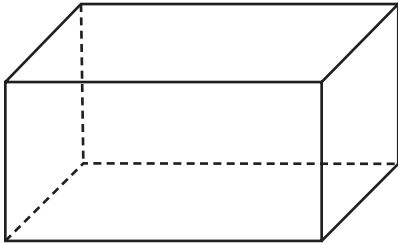$\frac{1}{9} = 0.111\ldots$ $\frac{7}{12} = 0.58333\ldots$

$\frac{22}{7} = 3.142857142857\ldots$

right rectangular prism

A right rectangular prism is a polyhedron with three pairs of congruent and parallel rectangular faces.

Example

────── S ──────

sample

A sample is a selection from a population.

Example

If you wanted to determine the average height of the students in your school, you could choose a certain number of students and measure their heights. The heights of the students in this group would be your sample.

scale factor

The scale factor is the factor that you multiply or divide both parts of a ratio by to scale up or scale down to an equivalent ratio.

scaling down

Scaling down means to divide both parts of the ratio by the same factor greater than 1, or multiply both parts of the ratio by the same factor less than 1.

Example

$$\overset{\div\,3}{\frac{3}{6} = \frac{1}{2}}\underset{\div\,3}{}$$

scaling up

Scaling up means to multiply both parts of a ratio by the same factor greater than 1.

Example

$$\overset{\times\,3}{\frac{1}{2} = \frac{3}{6}}\underset{\times\,3}{}$$

scholarship

A scholarship is money awarded to a person from the college or private institution to help a student pay for school. Scholarships may be academic, athletic, based on financial need, or awarded from private organizations for a variety of reasons.

skewed left distribution

In a skewed left distribution of data the peak of the data is to the right side of the graph. There are only a few data points to the left side of the graph.
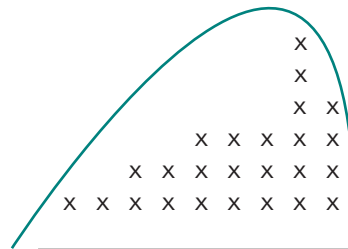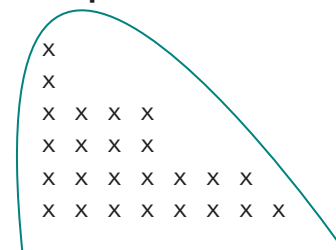
Example

skewed right distribution

In a skewed right distribution of data the peak of the data is to the left side of the graph. There are only a few data points to the right side of the graph.

Example

solution

A solution to an equation is any value for a variable that makes the equation true.

Example

The solution to the equation $2x + 4 = 8$ is $x = 2$.

solution set of the inequality

The set of all points that make an inequality true is the solution set of the inequality.

Examples

$x < 7$

The solution set for $x \geq 7$ is all the numbers greater than or equal to 7.

solve an inequality

To solve an inequality means to determine the values of the variable that make the inequality true.

Example

$$2x + 4 \geq 16$$
$$2x \geq 12$$
$$x \geq 6$$

Any value for x that is greater than or equal to 6 will make the inequality true.

stacked bar graph

A stacked bar graph is a graph that stacks the frequencies of two different groups for a given category on top of one another so that you can compare the parts to the whole.

Sports Preferences of 7th and 8th Grade Students
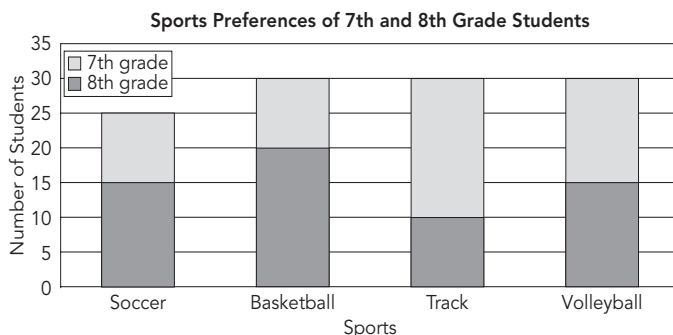
statement

A statement is a summary of the account balance. A statement includes every transaction that occurred throughout the month including deposits, withdrawals, debits, and transfers.

statistical process

The statistical process has four components:
- Formulating a statistical question.
- Collecting appropriate data.
- Analyzing the data graphically and numerically.
- Interpreting the results of the analysis.

statistical question

A statistical question is a question that anticipates an answer based on data that vary.

Example

"What sport is the most popular in your school?" is a statistical question because it anticipates that the answers will vary since not everyone at your school is likely to have the same favorite sport.

"How many students are in Chess Club?" is NOT a statistical question because there is only one answer to the question.

stem-and-leaf plot

A stem-and-leaf plot is a graphical method used to represent ordered numerical data. Once the data are ordered, the stem and leaves are determined. Typically, the stem is all the digits in a number except the rightmost digit, which is the leaf.

Example

Books Read in
Mr. Brown's Class

0	3, 6
1	0, 1, 5
2	
3	9, 9
4	0, 0, 0

Key: 1 | 0 = 10.

strip diagram

A strip diagram illustrates number relationships by using rectangles to represent ratio parts.

Example

A bakery sells packs of muffins in the ratio of 3 blueberry muffins : 2 pumpkin muffins : 1 bran muffin. The strip diagram represents the ratio of each type of muffin.

Blueberry

Pumpkin

Bran
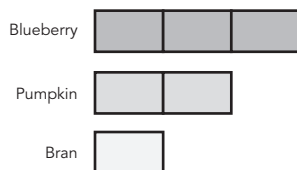
student loan

A student loan is money borrowed in order to pay for college or trade school.

Subtraction Property of Equality

The Subtraction Property of Equality states that when you subtract the same value c from equal values a and b, the differences are equal.

Examples

$12 = 12$ and $12 - 7 = 12 - 7$

If $a = b$, then $a - c = b - c$.

survey

A survey is one method of collecting data in which people are asked one or more questions.

Example

A restaurant may ask its customers to complete a survey with the following question:

On a scale of 1–10, with 1 meaning "poor" and 10 meaning "excellent," how would you rate the food you ate?
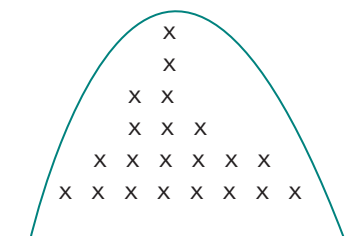
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

symmetric distribution

In a symmetric distribution of data the left and right halves of the graph are mirror images of each other. The peak is in the middle because there are many data values in the center.

Example

```
                x
                x
            x   x
            x   x   x
        x   x   x   x   x   x
    x   x   x   x   x   x   x   x
```

Symmetric Property of Equality

The Symmetric Property of Equality states that if $a = b$, then $b = a$.
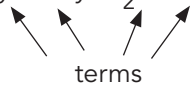
Example

$x = 3$ is the same as $3 = x$.

term

A term of an algebraic expression is a number, variable, or product of numbers and variables.

Example

The expression has four terms.

$$3y + 5xy + \frac{1}{2}x + 6$$

terms

terminating decimal

A terminating decimal has a finite number of digits, meaning that after a finite number of decimal places, all following decimal places have a value of 0. Terminating decimals are rational numbers.

Examples

$\frac{9}{10} = 0.9 \quad \frac{15}{8} = 1.875 \quad \frac{193}{16} = 12.0625$

transfer

A transfer occurs when money is moved from one account to another.

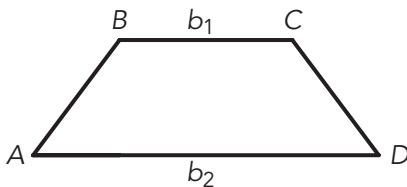## trapezoid

A trapezoid is a quadrilateral with two bases that are parallel to each other, often labeled b_1 and b_2.

Example

Quadrilateral *ABCD* is a trapezoid. Side *BC* is parallel to side *AD*.

Triangle Inequality Theorem

The Triangle Inequality Theorem states that the sum of the lengths of any two sides of a triangle is greater than the length of the third side.

Triangle Sum Theorem

The Triangle Sum Theorem states that the sum of the measures of the interior angles of a triangle is 180°

tuition

Tuition is the fee paid in order to receive instruction at a school.

undergraduate degree

An undergraduate degree is a four-year degree from a college or university.

unit cube

A unit cube is a cube whose sides are all 1 unit long

unit fraction

A unit fraction is a fraction that has a numerator of 1 and a denominator that is a positive integer.

unit rate

A unit rate is a comparison of two different measurements in which the numerator or denominator has a value of one unit.

Example

The speed 60 miles in 2 hours can be written as a unit rate:

$\frac{60 \text{ mi}}{2 \text{ h}} = \frac{30 \text{ mi}}{1 \text{ h}}$.

The unit rate is 30 miles per hour.

unit rate of change

The unit rate of change describes the amount the dependent variable changes for every unit the independent variable changes.

---- V ----

variability

In statistics, variability means that the value of the attribute being studied can change from one person or thing to another.

variable

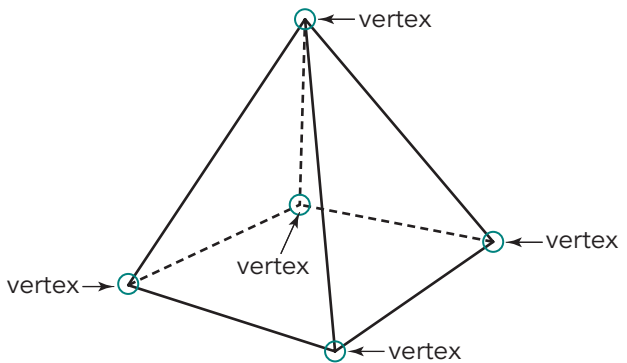A variable is a letter or symbol that is used to represent a number.

Examples

$3x = 81$ $\frac{4}{p}$ z^2

variables

vertex

A vertex of a polyhedron is a point at which three or more of its edges meet.

Example

vocational school

A vocational school is a school in which students are taught the skills needed to perform a particular job.

volume

Volume is the amount of space occupied by an object. Volume is measured in cubic units.

---- W ----

withdrawal

A withdrawal occurs when money is taken out of an account, usually from a check, online payment, or Automated Teller Machine (ATM).

work-study program

A work-study program is a plan set up by the college that allows a student to work while in school to earn money.

— Z —

zero pair

A positive counter and a negative counter together make a zero pair, since the total value of the pair is zero.

Example

$\oplus + \bullet = 0$

Zero Property of Multiplication

The Zero Property of Multiplication states that the product of any number and 0 is 0.

Examples

$6 \times 0 = 0$ $\qquad$ $\frac{3}{4} \times 0 = 0$

$5^2 \cdot 0 = 0$ $\qquad$ $0.125(0)\, 0 = 0$