Glossary

401(k) plan

A 401(k) plan is a retirement investment account set up by an employer. A portion of an employee's pay is invested into the account with the employer often matching a certain amount of it.

403(b) plan

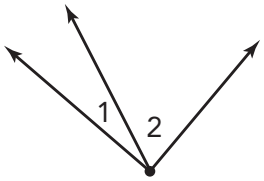
A 403(b) plan is a retirement plan generally for public school employees or other tax exempt groups.

A

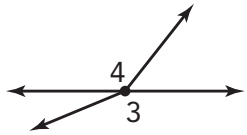
adjacent angles

Adjacent angles are two angles that share a common vertex and share a common side.

Examples



Angles 1 and 2 are adjacent angles.



Angles 3 and 4 are NOT adjacent angles.

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

appreciation

Appreciation is an increase in price or value.

asset

Assets include the value of all accounts, investments, and things that you own. They are positive and add to your net worth.

Example

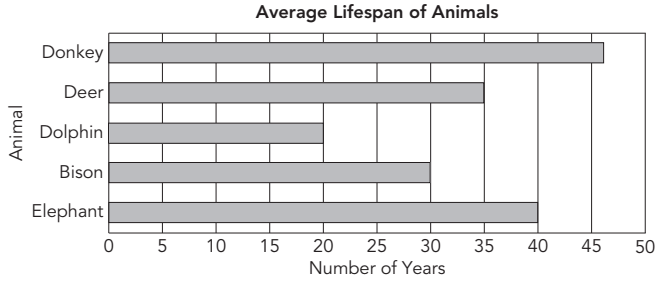
Savings account, retirement account, and a paid off car are examples of assets because they are things that are owned.

B

bar graph

Bar graphs display data using horizontal or vertical bars so that the height or length of the bars indicates its value for a specific category

Example



bar notation

Bar notation is used to indicate the digits that repeat in a repeating decimal.

Example

In the quotient of 3 and 7, the sequence 428571 repeats. The numbers that lie underneath the bar are the numbers that repeat.

$\frac{3}{7} = 0.4285714285714... = 0.\overline{428571}$

C

census

A census is the data collected from every member of a population.

Example

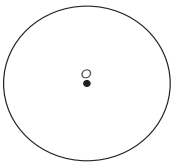
The U.S. Census is taken every 10 years. The U.S. government counts every member of the population every 10 years.

circle

A circle is a collection of points on the same plane equidistant from the same point. The center of a circle is the point from which all points on the circle are equidistant. Circles are named by their center point.

Example

The circle shown is Circle *O*.

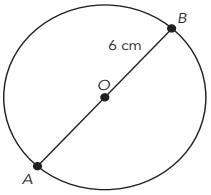


circumference

The distance around a circle is called the circumference of the circle. The circumference is calculated by the formula: $C = \pi(d)$.

Example

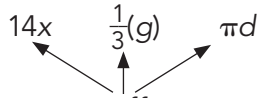
The diameter of Circle *O* is 12 centimeters. The circumference of Circle *O* is 12π.

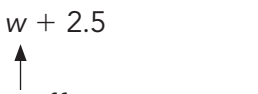


coefficient

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

Examples





The coefficient is 1 even though it is not shown.

collinear

When points lie on the same line or line segment, they are said to be collinear.

Example

Points *C*, *A*, and *B* are collinear.

commission

A **commission** is an amount of money a salesperson earns after selling a product. Many times, the commission is a certain percent of the product.

Example

5% commission on $350

$0.05 \times 350 = \$17.50$ ← commission

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

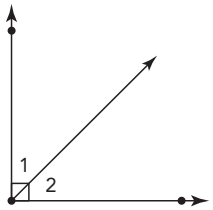
factors of 24: **1**, **2**, **3**, **4**, **6**, 8, **12**, 24

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

complementary angles

Two angles are complementary angles if the sum of their angle measures is equal to 90°.

Example



Angles 1 and 2 are complementary angles.

complementary events

Complementary events are events that together contain all of the outcomes in the sample space.

Example

When rolling a six-sided number cube with the numbers 1 through 6 on each face, the event of rolling an even number and the event of rolling an odd number (not even) are complementary events.

complex ratio

A ratio in which one or both of the quantities being compared are written as fractions is a complex ratio.

Example

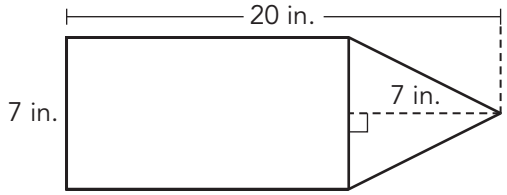
Traveling $\frac{1}{3}$ mile in $\frac{1}{2}$ hour represents a ratio of fractions, or a complex ratio.

composite figure

A figure that is made up of more than one geometric figure.

Example

A composite figure shown is composed of a rectangle and a triangle.



compound event

A compound event combines two or more events, using the word "and" or the word "or."

compound interest

Compound interest is a percentage of the principal and the interest that is added to the principal over time. The formula for compound interest is $B = P_0 (1 + r)^t$ where B represents the final balance, P_0 represents the original principal, r represents the annual rate, and t represents the time in years.

Example

Rachel invests $850 in an account with a 3% interest rate. The account is open for 8 years.

$B = 850(1 + 0.03)^8$

$B = 1076.75$

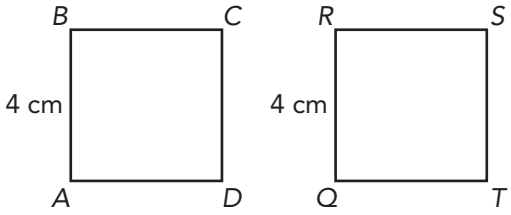
After 8 years, Rachel's account balance is now $1076.75.

congruent

Congruent means to have the same size, shape, and measure.

Example

Square *ABCD* is congruent to Square *QRST*.



constant of proportionality

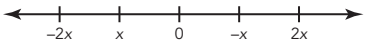
In a proportional relationship, the ratio of all y-values to their corresponding x-values is constant. This specific ratio, $\frac{y}{x}$, is called the constant of proportionality. Generally, the variable k is used to represent the constant of proportionality.

constraint

A constraint is a condition that a solution or problem must satisfy. A constraint can be a restriction set in advance of solving a problem or a limit placed on a solution or graph so the answer makes sense in terms of a real-world scenario.

Example

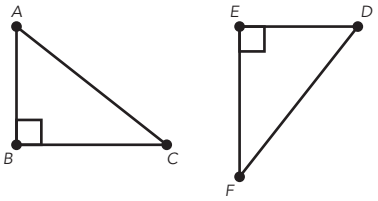
The expressions 0, x, $2x$, $-x$, and $-2x$ are graphed on a number line using the constraint $x < 0$.



corresponding

Corresponding means to have the same relative position in geometric figures, usually referring to sides and angles.

Example



Sides *AB* and *DE* are corresponding sides.

Angle *B* and Angle *E* are corresponding angles.

coupon

A coupon is a detachable part of a ticket or advertisement that entitles the holder to a discount. Coupons are commonly used to entice people to shop at certain stores.

Example

Coupon for 10% off a vacuum cleaner at Carnegie Home Store.

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

depreciation

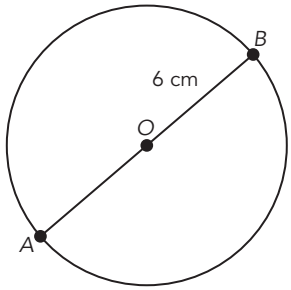
Depreciation is a decrease in price or value

diameter

The diameter of a circle is a line segment formed by connecting two points on the circle such that the line segment passes through the center point.

Example

In Circle *O*, segment *AB* is a diameter. The length of diameter *AB* is two times the length of radius *OA*. The length of radius *OA* is 6 centimeters, so the length of diameter *AB* is 12 centimeters.



direct variation

A situation represents a direct variation if the ratio between the y-value and its corresponding x-value is constant for every point. The quantities are said to vary directly.

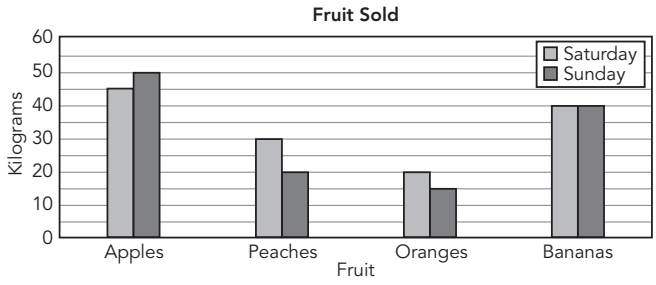
Example

If Melissa earns $8.25 per hour, then the amount she earns is in direct variation with the number of hours she works. The amount $8.25 is the constant of proportionality.

double bar graph

A double graph is used when each category contains two different groups of data.

Example



E

equally likely

When the probabilities of all the outcomes of an experiment are equal, then the outcomes are called equally likely.

Example

When rolling a six-sided number cube with the numbers 1 through 6 on each face, the probability of rolling each number from 1 through 6 is equally likely.

equation

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

Examples

$$y = 2x + 4$$

$$6 = 3 + 3$$

$$2(8) = 26 - 10$$

$$\frac{1}{4} \cdot 4 = \frac{8}{4} - \frac{4}{4}$$

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: $\frac{10 + 0}{2} = \frac{10}{2} = 5$.

event

An event is one possible outcome or a group of possible outcomes for a given situation.

Example

When rolling a six-sided number cube with the numbers 1 through 6 on each face, an event could be rolling an even number.

experiment

An experiment is a situation involving chance that leads to results, or outcomes.

Example

Rolling a six-sided number cube is an experiment.

experimental probability

Experimental probability is the ratio of the number of times an event occurs to the total number of trials performed.

Example

Suppose there is one red, one blue, one green, and one yellow marble in a jar. You draw the blue marble 20 times out of 50 trials. The experimental probability, P_E(blue), is $\frac{20}{50}$ or $\frac{2}{5}$.

extremes

In a proportion that is written $a : b = c : d$, the two values on the outside, a and d, are the extremes.

Example

7 books : 14 days = 3 books : 6 days

extremes

F

factor

To factor an expression means to rewrite the expression as a product of factors.

Example

$5(12) + 5(9) = 5(12 + 9)$

Family Budget Estimator

The Family Budget Estimator is an online tool that allows residents to determine the cost of raising a family in each of Texas' major metropolitan areas. This resource is accessible via www.familybudgets.org

fixed expenses

Fixed expenses are expenses that don't change from month to month.

Example

Mortgage payment, utility bills, and savings account deposit are examples of fixed expenses.

G

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

I

income tax

Income tax is a percentage of a person's or company's earnings that is collected by the government.

Example

If a person earns $90,000 in one year and has to pay an income tax rate of 28%, then that person owes $90{,}000 \times 0.28$ or $25,200 in income tax to the government.

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: $351 \times 25 \div 25 = 351$.

isolate the variable

When you isolate the variable in an equation, you perform an operation, or operations, to get the variable by itself on one side of the equals sign.

Example

In the equation $\frac{a}{b} = \frac{c}{d}$, you can multiply both sides by b to isolate the variable a.

$b \cdot \frac{a}{b} = b \cdot \frac{c}{d} \longrightarrow a = \frac{bc}{d}$

L

lateral surface area

The lateral surface area of a prism or pyramid is the sum of the areas of the lateral faces. To calculate the lateral surface area of a prism or pyramid, determine the total surface area of the figure and then subtract the area of the base(s).

liability

A liability is a financial obligation, or debt, that you must repay. It is negative and takes away from your net worth.

Example

Mortgage, credit cards, and school loans are examples of liabilities because they must be repaid.

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 expression

A linear expression is any expression in which each term is either a constant or the product of a constant and a single variable raised to the first power.

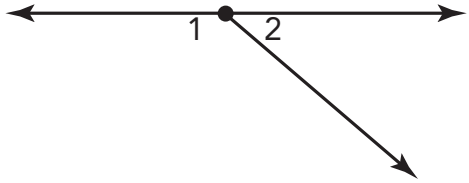
Examples

$\frac{1}{2}x + 2$, $-3 + 12.5x$, $-1 + 3x + \frac{5}{2}x - \frac{4}{3}$

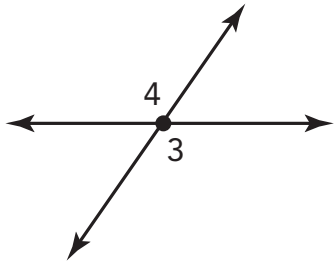
linear pair

A linear pair of angles is formed by two adjacent angles that have noncommon sides that form a line.

Examples



Angles 1 and 2 form a linear pair.



Angles 3 and 4 do NOT form a linear pair.

literal equation

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

Examples

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

M

markdown

When businesses sell an item at a lower price than the original price, it is called a markdown.

markup

To make money, businesses often buy products from a wholesaler or distributor for one amount and add to that amount to determine the price they use to sell the product to their customers. This is called a markup.

means

In a proportion that is written $a : b = c : d$, the two values in the middle, b and c, are the means.

Example

7 books : 14 days = 3 books : 6 days

means

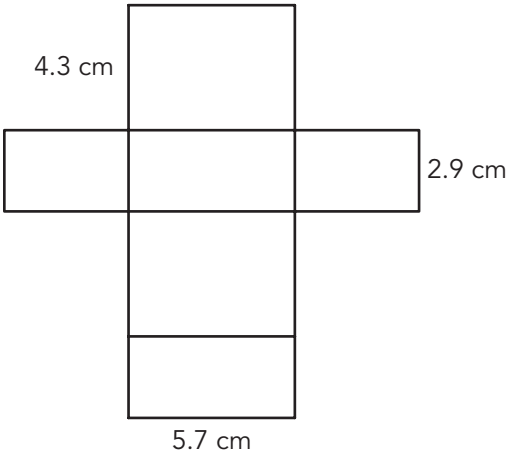
N

net

A net is a two-dimensional representation of a three-dimensional geometric figure. A net can be cut out as a single piece. All of the faces of the geometric solid are represented in the net. The faces of the geometric solid are drawn so that they share common edges.

Example

This is a net of a rectangular prism.



net worth

Your net worth is a calculation of the value of everything that you own minus the amount of money that you owe.

Example

Net worth = Assets - Liabilities

non-repeating decimals

A non-repeating decimal continues without terminating and without repeating a sequence of digits. Non-repeating decimals are not rational numbers.

Examples

$\sqrt{3} = 1.73205080757\ldots$ $\pi = 3.14159265359\ldots$

non-terminating decimal

A non-terminating decimal is a decimal that continues on infinitely without ending in a sequence of zeros.

Examples

0.333… 1.7272… 3.14159...

non-uniform probability model

A non-uniform probability model occurs when all the probabilities in a probability model are not equal to each other.

Example

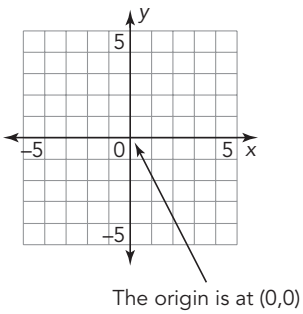
Outcome	Red	Green	Blue
Probability	$\frac{1}{8}$	$\frac{1}{2}$	$\frac{3}{8}$

O

origin

The origin is a point on a graph with the ordered pair (0, 0).

Example



outcome

An outcome is the result of a single trial of a probability experiment.

Example

The numbers on the faces of a six-sided number cube are the outcomes that can occur when rolling a six-sided number cube.

P

parameter

When data are gathered from a population, the characteristic used to describe the population is called a parameter.

Example

If you wanted to determine the average height of the students at your school, and you measured every student at the school, the characteristic "average height" would be a parameter.

percent decrease

A percent decrease occurs when the new amount is less than the original amount. It is a ratio of the amount of decrease to the original amount.

Example

The price of a $12 shirt has decreased to $8.

$\frac{12 - 8}{12} = \frac{4}{12} = 0.\overline{3} \approx 33\%$

The percent decrease is approximately 33%

percent equation

A percent equation can be written in the form percent × whole = part, where the percent is often written as a decimal.

Example

40% of 25 = 10

(0.40) (25) = 10

Percent Part

Whole

percent error (estimation)

Calculating percent error is one way to compare an estimated value to an actual value. To compute percent error, determine the difference between the estimated and actual values and then divide by the actual value.

Example

An airline estimates that they will need an airplane that sits 320 passengers for a flight. An actual 300 tickets were booked for the flight.

$\text{Percent Error} = \frac{300 - 320}{300} = \frac{-20}{300} \approx -6.7\%$

percent error (probability)

In probability, the percent error describes how far off the experimental probability is from the theoretical probability as a percent ratio.

Example

Suppose there is one red, one blue, one green, and one yellow marble in a jar. You draw the blue marble 20 times out of 50 trials.

The experimental probability, P_E(blue), is $\frac{20}{50}$ or $\frac{2}{5}$. The theoretical probability, P_T(blue), is $\frac{1}{4}$.

The percent error is $\frac{\frac{2}{5}-\frac{1}{4}}{\frac{1}{4}} = \frac{\frac{3}{20}}{\frac{1}{4}} = \frac{3}{5}$

$= 0.6 = 60\%$

percent increase

A percent increase occurs when the new amount is greater than the original amount. It is a ratio of the amount of increase to the original amount.

Example

The price of a $12 shirt has increased to $13.20.

$\frac{13.20-12}{12} = \frac{1.20}{12} = 0.1 = 10\%$

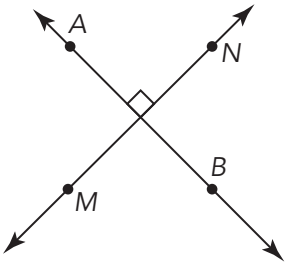
The percent increase is 10%.

perpendicular

Two lines, line segments, or rays are perpendicular if they intersect to form 90° angles. The symbol for perpendicular is $\perp$.

Example

Line *AB* is perpendicular to line *MN*



personal budget

A personal budget is an estimate of the amount of money that a person or family will need for specific financial items. It generally includes current expenses as well as savings for anticipated future expenses.

pi

The number pi (π) is the ratio of the circumference of a circle to its diameter. That is $\pi = \frac{C}{d}$, where C is the circumference of the circle, and d is the diameter of the circle.

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.

principal

A principal is the term for an original amount of money on which interest is calculated.

probability

Probability is the measure of the likelihood that an event will occur. It is a way of assigning a numerical value to the chance that an event will occur by dividing the number of times an event can occur by the number of possible outcomes.

Example

When rolling a six-sided number cube with the numbers 1 through 6 on each face, the probability of rolling a 5, or $P(5)$, is $\frac{1}{6}$.

probability model

A probability model is a list of each possible outcome along with its probability, often shown in a table.

Example

Outcome	1	2	3	4	5	6
Probability	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

This is a probability model for rolling a six-sided number cube with the numbers 1 through 6 on each face.

proportion

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

Example

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

proportional relationship

A proportional relationship is one in which the ratio of the inputs to the outputs is constant. For a relationship to illustrate a proportional relationship, all the ratios $\frac{y}{x}$ or $\frac{x}{y}$, must represent the same constant.

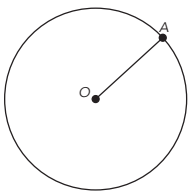
R

radius

The radius of a circle is a line segment formed by connecting a point on the circle and the center of the circle.

Example

In the circle, *O* is the center and segment *OA* is the radius.



random number table

A random number table is a table that displays random digits. These tables can contain hundreds of digits.

Example

Line 7	54621	62117	55516	40467

random sample

A random sample is a sample that is selected from the population in such a way that every member of the population has the same chance of being selected.

Example

If you wanted to determine the average height of the students at your school, you could choose just a certain number of students randomly and measure their heights. This group of students would be a random sample.

rebate

A rebate is a refund of part of the amount paid for an item. Generally, a customer completes and mails a form to a company after a purchase, and a rebate check is mailed to the customer.

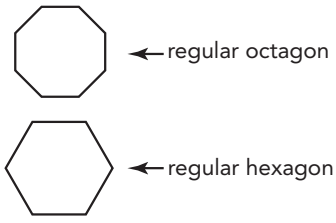
Example

$150 mail-in rebate for the purchase of any Brand X refrigerator.

regular polygon

A regular polygon is a polygon with all sides congruent and all angles congruent.

Examples



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

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

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

S

sale

A sale is an event at which products are sold at reduced prices. Sales are typically held to clear outdated inventory.

Example

Washer/Dryer sale in which all washers and dryers are 20% off.

sales tax

Sales tax is a percentage of the selling price of a good or service which is added to the price.

Example

You want to purchase an item for $8.00 in a state where the sales tax is 6.25%, therefore you will pay 8×0.0625 or $0.50 in sales tax. You will pay a total of $8.50 for the item.

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.

sample space

A list of all possible outcomes of an experiment is called a sample space.

Example

When rolling a six-sided number cube that has one number, from 1 through 6, on each face, the sample space is {1, 2, 3, 4, 5, 6}.

scale

A scale is a ratio that compares two measures.

Example

1 cm : 4 cm

scale drawing

A scale drawing is a representation of a real object or place that is in proportion to the real object or place it represents.

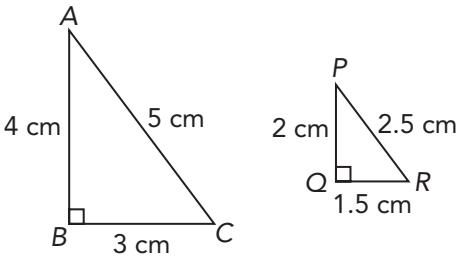
Examples

A map or a blueprint is an example of a scale drawing.

scale factor

When you multiply a measure by a scale to produce a reduced or enlarged measure, the scale is called a scale factor.

Example

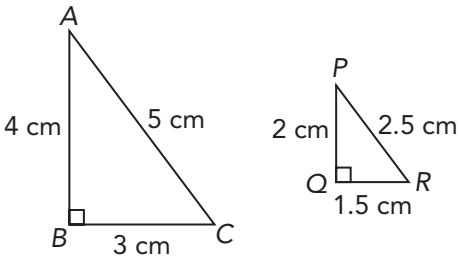


The scale factor from Triangle *ABC* to Triangle *PQR* is $\frac{1}{2}$.

similar figures

Figures that are proportional in size, or that have proportional dimensions, are called similar figures.

Example



Triangle *ABC* and Triangle *PQR* are similar figures.

simple event

A simple event is an event consisting of one outcome.

Example

When rolling a six-sided number cube with the numbers 1 through 6 on each face, rolling a 5 is a simple event.

simple interest

Simple interest is a type of interest that is a fixed percent of the principal. Simple interest is paid over a specific period of time—either twice a year or once a year, for example. The formula for simple interest is $I = P \times r \times t$, where I represents the interest earned, P represents the amount of the principal, r represents the interest rate, and t represents the time that the money earns interest.

Example

Kim deposits $300 into a savings account at a simple interest rate of 5% per year. The formula can be used to calculate the simple interest Kim will have earned at the end of 3 years.

Interest = Principal × rate × time

Interest = (300)(0.05)(3)

= $45

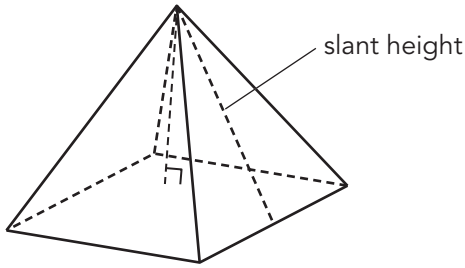
simulation

A simulation is an experiment that models a real-life situation.

slant height

A slant height of a pyramid is the distance measured along a triangular face from the vertex of the pyramid to the midpoint, or center, of the base.

Example



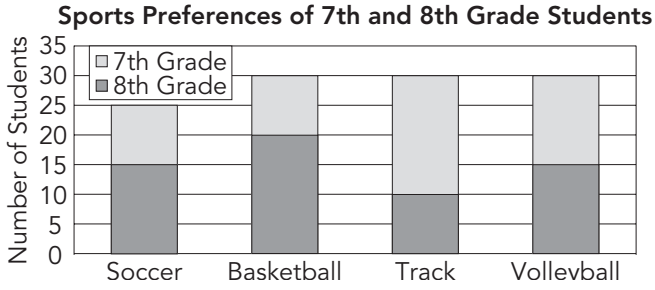
solve a proportion

To solve a proportion means to determine all the values of the variables that make the proportion 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.

Example



statistic

When data are gathered from a sample, the characteristic used to describe the sample is called a statistic.

Example

If you wanted to determine the average height of the students in your school, and you chose just a certain number of students randomly and measured their heights, the characteristic "average height" would be called a statistic.

straight angle

A straight angle is formed when the sides of the angle point in exactly opposite directions. The two legs form a straight line through the vertex.

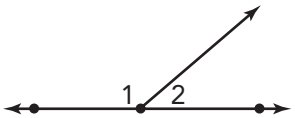
Example

Angle *CAB* is a straight angle.

supplementary angles

Two angles are supplementary angles if the sum of their angle measures is equal to 180°.

Example



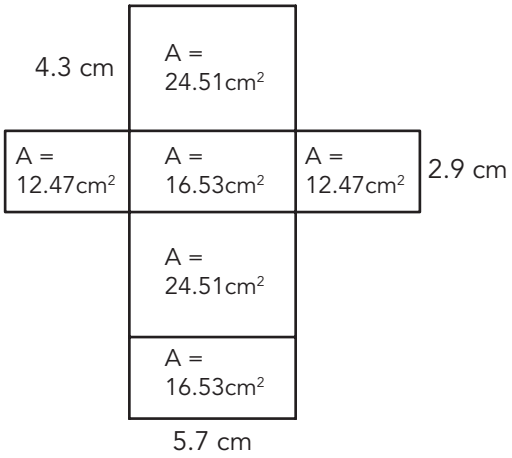
Angles 1 and 2 are supplementary angles.

surface area

The surface area of a three-dimensional geometric figure is the total area of all its two-dimensional faces.

Example

For example, you can use the net to calculate the surface area of the right rectangular prism. Determine the area of each unique face. Calculate the sum of all faces of the right rectangular prism



The surface area of the right rectangular prism is 107.02 cm^2.

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?

T

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

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

theoretical probability

The theoretical probability of an event is the ratio of the number of desired outcomes to the total possible outcomes.

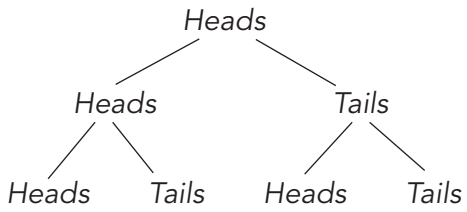
Example

Suppose there is one red, one blue, one green, and one yellow marble in a jar. The theoretical probability of drawing a blue marble, P_T(blue), is $\frac{1}{4}$.

tree diagram

A tree diagram illustrates the possible outcomes of a given situation. It has two main parts: the branches and the ends. An outcome of each event is written at the end of each branch.

Example



two-step equation

A two-step equation requires that two inverse operations be performed in order to isolate the variable.

U

uniform probability model

A uniform probability model occurs when all the probabilities in a probability model are equally likely to occur.

Example

Outcome	1	2	3	4	5	6
Probability	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

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

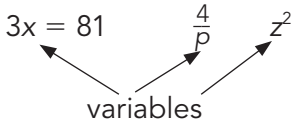
The unit rate of change describes the amount the dependent variable changes for every unit the independent variable changes.

V

variable

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

Examples



variable expenses

Variable expenses are expenses that can be different from month to month.

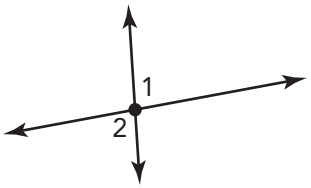
Example

Monthly expenses on food, clothes shopping, and entertainment are examples of variable expenses.

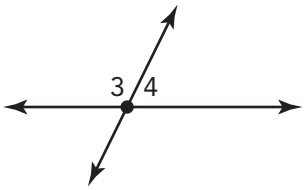
vertical angles

Vertical angles are two nonadjacent angles that are formed by two intersecting lines.

Examples



Angles 1 and 2 are vertical angles.



Angles 3 and 4 are NOT vertical angles.