

Appendix

GlossaryA-2

CreditsA-5

Glossary

A

accuracy The accuracy of a measure (an approximate number) refers to the ratio of the size of the maximum possible error to the size of the number. This ratio is called the relative error. We express the accuracy as a percent, by converting the relative error to a decimal and subtracting it from 1 (and writing the resulting decimal as a percent). The smaller the relative error, the more accurate the measure.

acute angle An acute angle is an angle with a measurement greater than 0 degrees and less than 90 degrees.

adjacent angles Adjacent angles are angles that share a common vertex and a common side between them.

area Area is a measure of how much surface is covered by a figure.

C

central angle A central angle, for regular polygons, has its vertex at the center of the polygon, and its rays go through any two adjacent vertices.

circumference Circumference is a term used to indicate a circle's perimeter.

compensatory principle The compensatory principle states that the smaller the unit used to measure the distance, the more of those units that will be needed. For example, measuring a distance in centimeters will result in a larger number of that unit than measuring a distance in kilometers.

complementary angles Complementary angles are such that the sum of their angle measures equals 90 degrees.

cone A cone is a solid with a circular face at the bottom, a single point at the top, and a curved face connecting them.

congruent angles Congruent angles are angles that have equal angle measurements.

conservation Conservation is the principle that an object maintains the same size and shape if it is repositioned or divided in certain ways.

cross section A cross section is the face you get when you make one slice through a three-dimensional object.

cylinder A cylinder is a solid with two identical circles as faces at the top and bottom, and a single curved face connecting them. A cylinder can be considered a prism with an infinite number of edges!

D

diameter Diameter is the distance between two points on a circle, measured through the center.

E

exterior angle An exterior angle is an angle outside a polygon that lies between one side and an adjacent extended side.

I

interior (vertex) angle An interior angle, or vertex angle, is an angle that lies between two sides inside a polygon.

irrational number An irrational number is a number that cannot be written in the form a/b where both a and b are integers and b is not equal to 0. Informally, we often state that an irrational number has decimal places that continue infinitely without repeating.

irregular polygon An irregular polygon is any polygon that is not regular (see regular polygon).

M

measurable properties Measurable properties can be quantified using a unit. When you combine objects possessing a measurable property, the property increases.

measurement Measurement is the process of quantifying properties of an object by comparing them with a standard unit.

metric system The metric system is a system of measurement based on standard prefixes and powers of 10. It has base units for length, capacity, mass, etc., and is more consistent than other systems of measurement.

midline A midline is a segment connecting two midpoints of a triangle.

N

net A net is a two-dimensional representation of a three-dimensional object.

Glossary, cont'd.

O

obtuse angle

An obtuse angle is an angle with a measurement greater than 90 but less than 180 degrees.

P

partitioning Partitioning is the division of something into parts. In measurement, partitioning is done with units: A meter is divided into centimeters, a gallon is divided into quarts, and so on. The level of partitioning used in a measurement affects the precision of that measurement. For example, a measurement taken with a meterstick divided into centimeters is more precise than a measurement taken with an unmarked meterstick.

perimeter Perimeter is the length or distance around a closed curve or a shape.

pi (π) Pi is the ratio between the circumference and diameter of a circle. Pi is a constant number, approximately 3.14159, and is irrational. The numbers 22/7 and 3.14 are frequently used as approximations to π .

polygon A polygon is a two-dimensional geometric figure with these characteristics: It is made of straight line segments; each segment touches exactly two other segments, one at each of its endpoints; and it is closed—in other words, it divides the plane into two distinct regions, one inside and the other outside the polygon.

precision The precision of a measuring device tells us how finely a particular measurement was made.

prefixes The prefixes used by the metric system indicate the powers of 10 used to convert from one unit type to another. Common prefixes include “kilo-” for 1,000; “centi-” for one 100th; and “milli-” for one 1,000th.

prism A prism is a solid whose lateral edges are all parallel and which has two identical faces at the top and bottom. A prism can have any polygon as its base. Many tall buildings are prisms.

proportion A proportion is an equation that states that two ratios are equal, for example $2:1 = 6:3$ (or $2/1 = 6/3$).

R

ratio A ratio is a comparison between two quantities. A measurement is a type of ratio—it is a comparison with a unit. When we state that an object is eight inches long, we mean in comparison to the unit of one inch.

referents Referents make measurement tasks easier by establishing benchmarks for a certain measure. Two examples of referents are a stretch of road that is about a mile and an adult arm length that is about a meter.

regular polygon A regular polygon has sides that are all the same length and angles that are all the same size.

right angle A right angle is an angle that measures 90 degrees.

S

scale The scale used on a map or model is an example of a measurement ratio. A map with a scale of 1:250 indicates that one unit on the map is equal to 250 units in the actual distances represented by the map.

scale factor A scale factor is a constant used to enlarge or reduce a figure. For example, if the sides of a triangle are enlarged to twice the length of the original triangle, we say the scale factor is 2.

similar figures Similar figures are figures that have the same shape but may be of different sizes. In similar figures, corresponding angles are congruent *and* corresponding segments are in proportion.

similar triangles Similar triangles are triangles that have the same shape but may be different sizes. In similar triangles, the corresponding angles are congruent, and the corresponding sides are in proportion.

sphere A sphere is a solid made up of points all equidistant from a center in three dimensions. It is a perfect ball.

supplementary angles Supplementary angles are such that the sum of their angle measures equals 180 degrees.

surface area Surface area is the area enclosing a three-dimensional or solid object. You can find it by taking the sum of the areas of all of the surfaces of a three-dimensional object.

Glossary, cont'd.

T

tangent The tangent of an acute angle in a right triangle ($\angle\alpha$) is the length of the side opposite to $\angle\alpha$ divided by the length of the side adjacent to $\angle\alpha$. We often abbreviate this as $\tan \alpha = (\text{opposite})/(\text{adjacent})$.

transitivity Transitivity is a mathematical property stating that if A and B satisfy a relation and B and C satisfy the same relation, then A and C also satisfy the relation. Common examples include equality comparisons (if $A = B$ and $B = C$, then $A = C$), inequality comparisons (if $A < B$ and $B < C$, then $A < C$), and parallelism (if Line A is parallel to Line B, and Line B is parallel to Line C, then Line A is parallel to Line C). Transitivity allows objects to be compared indirectly, and allows measurements to be consistent in comparisons.

U

unit A unit is an appropriate and standard measurement that is used as the basis for other measurements. Examples of units are meters, seconds, liters, and grams.

unit iteration Unit iteration is the repetition of a single unit for a measurement. For example, someone wishing to measure the length of a field with only a meterstick would need to use unit iteration.

U.S. customary system The U.S. customary system is the system of measurement typically used in the United States. Its units include inches, gallons, and pounds. This system is not as consistent as the metric system. Additionally, conversions between units are nonstandard—how many people know how many drams are in a pennyweight?!

V

volume Volume is the three-dimensional space taken up by an object.

W

weight Weight is the force of gravity on an object. An object in a gravitational field has both a mass and a weight, which are not the same thing. For example, an object in outer space might be weightless, but it still has mass.

Credits

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Session 4

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