

$$A = l \times w$$

$$\pi = 3.14$$

PJHS

Math Facts

$$4 + 6 = 6 + 4$$

$$\frac{1}{2} = 0.5$$

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Numbers and Operations

1. A whole number that has more than two factors is a **composite number**.
2. A **prime number** has exactly two factors, 1 and the number itself.
3. **Integers** are positive and negative whole numbers, including zero.
4. When solving a problem with multiple operations, use the **order of operations** PEMDAS: Parentheses, Exponents, Multiplication or Division (left to right), Addition or Subtraction (left to right)
5. The **absolute value** of a number is the distance between the number and zero on a number line.
6. The answer to an addition problem is called the **sum**.
7. The answer to a subtraction problem is called the **difference**.
8. The answer to a multiplication problem is called the **product**.
9. The answer to a division problem is called the **quotient**.

Exponents

10. A **base** is the number or the variable that is being raised to a power.
11. An **exponent** tells you how many times a base is used as a factor.
12. A **power** is a number expressed using an exponent.
13. **Scientific Notation** is a way of writing very large numbers and very small numbers using powers of ten.
14. A **perfect square** is the product of two identical numbers. $4^2 = 4 \times 4 = 16$
15. The **square root** of a number is a number which when multiplied by itself equals the given number.

Properties

16. The **associative property** of addition and multiplication says that if numbers are grouped together differently, the expressions will still remain equal. $(1 + 2) + 3 = 1 + (2 + 3)$ and $4 \cdot (5 \cdot 6) = (4 \cdot 5) \cdot 6$
17. The **commutative property** of addition and multiplication says that when you change the order, the expressions will still remain equal. $7 + 8 = 8 + 7$ and $9 \cdot 10 = 10 \cdot 9$
18. The **distributive property** shows that $a \cdot (b + c) = a \cdot b + a \cdot c$. You multiply "a" by each "b" and by "c".
 $2(3 + 4) = 2 \cdot 3 + 2 \cdot 4$
19. The **zero property of multiplication** states that the product of zero and any number is zero. $5 \cdot 0 = 0$

Fractions, Decimals and Percents

20. The number on the top of a fraction is called the **numerator**.
21. The number on the bottom of a fraction is called the **denominator**.
22. A fraction where the numerator is greater than the denominator is called an **improper fraction**.
23. A **mixed number** has a whole number and a fraction.
24. The **least common denominator** (LCD) of two fractions can be found by finding the lowest common multiple of the two denominators.
25. The **greatest common factor** (GCF) of two numbers is the greatest number that is a factor of both numbers.
26. Two numbers are **reciprocals** if their product is one.
27. A **percent** (%) is a ratio that compares a number to 100.

Ratios and Proportions

28. A **proportion** is an equation stating that two ratios are equal.
29. A **ratio** is a comparison of two numbers by division.

Data and Statistics

30. **Data** is information gathered.
31. **Frequency** is the number of times something occurs in a set of data.
32. The **mean** (average) of a set of data is the sum of the data divided by the number of items in the set of data.
33. The **median** is the middle number when the data is in numerical order.
34. The **mode** of a set of data is the data item that occurs most often.
35. The **range** of a set of numerical data is the difference between the greatest and least values of the set.
36. A data item that is far apart from the rest of the data is an **outlier**.
37. **Line graphs** represent how data changes over time.
38. **Circle graphs** are best for comparing parts to a whole

Expressions and Equations

39. An **expression** is a mathematical sentence that contains numbers and / or variables, separated by operation signs.
 40. An **equation** is a mathematical sentence showing that two expressions are equal to each other.
 41. Any value or values that make an equation true is called a **solution**.
 42. **Inverse operations** are operations that undo each other (addition \leftrightarrow subtraction; multiplication \leftrightarrow division; square \leftrightarrow square root)
 43. A symbol, usually a letter, which stands for a number, is called a **variable**.
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Inequalities

44. An **inequality** is a comparison of two expressions.
45. $<$ is the symbol for less than.
46. $>$ is the symbol for greater than.
47. \leq is the symbol for less than or equal to
48. \geq is the symbol for greater than or equal to.
49. \neq is the symbol for not equal to.

Points, Lines and Angles

50. A mathematical tool that is used to measure an angle is called a **protractor**.
51. An **angle** is made up of two rays that share a common endpoint called the vertex.
52. An angle that measures exactly 90 degrees is called a **right angle**.
53. An angle that measures greater than 90 degrees, but less than 180 degrees is called an **obtuse angle**.
54. An angle that measures less than 90 degrees is called an **acute angle**.
55. Two angles that are side by side and share a common ray are called **adjacent angles**.
56. Two adjacent angles, whose measurements add up to 90 degrees, are called **complementary angles**.
57. **Corresponding angles** are created when a transversal intersects two parallel lines.
58. **Vertical angles** are congruent angles formed whenever two lines intersect.
59. An angle that measures exactly 180 degrees is called a **straight angle**.
60. Two adjacent angles, whose measurements add up to 180 degrees are, called **supplementary angles**.
61. A straight path that extends in both directions forever is called a **line**.
62. Lines that are in the same plane that will never intersect are called **parallel lines**.
63. **Perpendicular lines** are lines that intersect to form right angles.
64. A straight path that extends in one direction forever is called a **ray**.
65. A line that intersects two parallel lines is called a **transversal**.
66. An **intersection** is where two lines cross.
67. The common endpoint where two rays intersect is called the **vertex**.
68. A **segment** is part of a line.
69. The **midpoint** of a segment is the point that divides the segment into two congruent segments.

Circles and Polygons

70. A **circle** is a closed curve where all the points are the same distance from the center.
 71. Half of a circle is called a **semicircle**.
 72. An **arc** is part of a circle.
 73. A segment that passes through the center of a circle and has both endpoints on the circle is called the **diameter**.
 74. A segment that has one endpoint at the center of a circle and the other endpoint on the circle is called a **radius**.
 75. A segment that has both endpoints on the circle is called a **chord**.
 76. A closed plane figure formed by three or more line segments that do not cross is called a **polygon**.
 77. A **regular polygon** has all sides congruent and all angles congruent.
 78. A **triangle** is a polygon with three sides.
 79. An **equilateral triangle** has all equal sides and equal angles.
 80. An **isosceles triangle** has two equal sides and two equal angles.
 81. A **scalene triangle** has no equal sides and no equal angles.
 82. The sum of the angles in a triangle will always equal 180 degrees.
 83. **Right triangles** have one 90-degree angle.
 84. **Obtuse triangles** have one angle more than 90 degrees.
 85. **Acute triangles** have only acute angles.
 86. A **quadrilateral** is a polygon with four sides.
 87. A **parallelogram** is a quadrilateral that has two sets of parallel lines.
 88. A **rectangle** is a quadrilateral that has two sets of parallel lines and four right angles.
 89. A **rhombus** (diamond) is a quadrilateral that has four congruent sides and no right angles.
 90. A **square** is a quadrilateral with two sets of parallel lines, four right angles and four congruent sides.
 91. A **trapezoid** is a quadrilateral that has exactly one pair of parallel sides.
 92. The sum of the angles in a quadrilateral will always equal 360 degrees.
 93. A five-sided polygon is called a **pentagon**.
 94. A **hexagon** is a polygon with six sides.
 95. An eight-sided polygon is called an **octagon**.
 96. A **decagon** is a polygon with ten sides.
 97. If two figures are **congruent**, then they have the same measurement.
 98. **Similar shapes** have the same shape and angles, but not necessarily the same size.
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Formulas

99. **Pi** (π) $\pi = 3.14$
100. The number of square units needed to cover the inside of a figure is called the **area**.
101. The area of a rectangle is $A = l \cdot w$
102. The area of a triangle is $A = \frac{1}{2} \cdot b \cdot h$
103. The area of a square is $A = s^2$
104. The area of a parallelogram is $A = b \cdot h$
105. The area of a circle is $A = \pi \cdot r^2$
106. The area of a trapezoid is $A = \frac{1}{2} \cdot h \cdot (b_1 + b_2)$
107. **Perimeter** is the distance around a figure.
108. The distance around a circle is called the **circumference**.
109. The circumference of a circle if the radius is known is $C = 2 \cdot \pi \cdot r$
110. The circumference of a circle if the diameter is known is $C = \pi \cdot d$
111. The **surface area** of a prism is the sum of the areas of the faces.
112. The **volume** of a three-dimensional figure is the number of cubic units needed to fill the space inside the figure.
113. The volume of a prism is $V = l \cdot w \cdot h$
114. The volume of a cylinder is $V = \pi \cdot r^2 \cdot h$
115. The **Pythagorean Theorem** states that in any right triangle, the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse. ($a^2 + b^2 = c^2$)
116. Distance Formula \rightarrow The distance something travels is equal to the rate (speed) it travels at multiplied by the time it travels
117. Interest is the money paid by a bank or borrower for the use of money
118. Principle is the amount of money being borrowed or deposited.
119. Rate is the percentage in an interest problem.

Coordinate planes

- 120. A horizontal number line (x-axis) and a vertical number line (y-axis) form a **coordinate plane**.
- 121. An **ordered pair** is a pair of numbers that describe the location of a point on a coordinate plane.
- 122. The point of intersection of the x-axis and the y-axis on a coordinate plane is called the **origin**.
- 123. The x-axis and y-axis divide the coordinate plane into four regions, called **quadrants**.
- 124. A **linear equation** is an equation that forms a line.
- 125. **Slope** is a ratio that describes the steepness of a line.
- 126. A graph that has a **positive slope** has a line that goes up from left to right.
- 127. A graph that has a **negative slope** has a line that goes down from left to right.
- 128. A graph with **no slope** is a vertical line.
- 129. A graph with **zero slope** is a horizontal line.
- 130. A **function** is a pairing of two sets of numbers where for every number in the first set there is only one corresponding number in the second set.
- 131. The **domain** of a function is the x values.
- 132. The **range** of a function is the y values.

Probability

- 133. **Probability** is used to describe how likely it is that an event will happen. It is the ratio of favorable outcomes to possible outcomes.
- 134. An **outcome** is a possible result.
- 135. When two events have no effect on each other they are considered **independent events**.
- 136. When a second event is affected by the result of a previous event, it is called **dependent events**.