**Advanced Elementary Math formula list – Grades 4-7**

**Fractions formulas:**









**Converting a mixed number to an improper fraction:**

**Converting an improper fraction to a mixed number:**


**Formula for a proportion:**



In a proportion, the product of the extremes (a \* d) equal the product of the means(b\*c),

Thus, a\*d = b\*c

**Percent:**

Percent to fraction: x% = x/100

Percentage formula: Rate/100 = Percentage/base

Rate: The percent.
Base: The amount you are taking the percent of.

Percentage: The answer obtained by multiplying the base by the rate

**Consumer math formulas:**

Discount = list price × discount rate

Sale price = list price − discount

Discount rate = discount ÷ list price

Sales tax = price of item × tax rate

Interest = principal × rate of interest × time

Tips = cost of meals × tip rate

Commission = cost of service × commission rate

**Geometry formulas:**

**Perimeter**:

Perimeter of a square: s + s + s + s
s:length of one side

Perimeter of a rectangle: l + w + l + w
l: length
w: width

Perimeter of a triangle: a + b + c
a, b, and c: lengths of the 3 sides

Circumference of a circle:

**Area:**

Area of a square: s × s
s: length of one side

Area of a rectangle: l × w
l: length
w: width

Area of a triangle: (b × h)/2
b: length of base
h: length of height

Area of a trapezoid: (b1 + b2) × h/2
b1 and b2: parallel sides or the bases
h: length of height

Area of a circle:

**Volume:**

Volume of a cube: s × s × s
s: length of one side

Volume of a box: l × w × h
l: length
w: width
h: height

**Distance**
1 foot = 12 inches
1 yard = 3 feet
1 mile = 5,280 feet
1 mile ≈ 1.61 kilometers
1 inch = 2.54 centimeters
1 foot = 0.3048 meters
1 meter = 1,000 millimeters
1 meter = 100 centimeters
1 kilometer = 1,000 meters
1 kilometer ≈ 0.62 miles

**Area**
1 square foot = 144 square inches
1 square yard = 9 square feet
1 acre = 43,560 square feet

**Volume**
1 cup = 8 fluid ounces
1 quart = 4 cups
1 gallon = 4 quarts
1 gallon = 231 cubic inches
1 liter ≈ 0.264 gallons
1 cubic foot = 1,728 cubic inches
1 cubic yard = 27 cubic feet
1 board foot = 1 inch by 12 inches by 12 inches

**Weight**
1 ounce ≈ 28.350 grams
1 pound = 16 ounces
1 pound ≈ 453.592 grams
1 milligram = 0.001 grams
1 kilogram = 1,000 grams
1 kilogram ≈ 2.2 pounds
1 ton = 2,000 pounds

**Triangle**
sum of angles = 180°
area = ½ (*base* x *height*)

**Circle**
number of degrees in a circle = 360°
circumference ≈ 3.14 x *diameter*
area ≈ 3.14 x (*radius*)2

**Simple interest**

Interest ( I ) =

Amount ( A) = Interest + Principal

Where P = Principal ( Amount invested)R = Rate of interest (%)

T = terms of investment (could be in years)

**Roman numeral symbols**

|  |
| --- |
| I=1 |
| V=5 |
| X=10 |
| L=50 |
| C=100 |
| D=500 |
| M=1,000 |

|  |  |  |
| --- | --- | --- |
| 1 = I2 = II3 = III4 = IV5 = V6 = VI7 = VII8 = VIII9 = IX10 = X | 11 = XI12 = XII13 = XIII14 = XIV15 = XV16 = XVI17 = XVII18 = XVIII19 = XIX20 = XX21 = XXI | 25 = XXV30 = XXX40 = XL49 = XLIX50 = L51 = LI60 = LX70 = LXX80 = LXXX90 = XC99 = XCIX |

**Average formula:**

Let a1,a2,a3,......,an be a set of numbers, average = (a1 + a2 + a3,+......+ an)/n

**Converting decimals to fractions**

**Note the following pattern for repeating decimals:**
0.22222222... = 2/9
0.54545454... = 54/99
0.298298298... = 298/999
Division by 9's causes the repeating pattern.

**Note the pattern if zeros precede the repeating decimal:**
0.022222222... = 2/90
0.00054545454... = 54/99000
0.00298298298... = 298/99900
Adding zero's to the denominator adds zero's before the repeating decimal.

**Number Properties**

(Odd)(Even) = Even
(Odd)(Odd) = Odd
(Even)(Even) = Even

(Odd) ± (Even) = Odd
(Odd) ± (Odd) = Even
(Even) ± (Even) = Even

(Positive)(Positive) = Positive
(Positive)(Negative) = Negative
(Negative)(Negative) = Positive
(Positive)/(Negative) = Negative
(Positive)/(Positive) = Positive
(Negative)/(Negative) = Positive

|  |  |  |
| --- | --- | --- |
| Number | squares | Cubes |
| 1 | 1 | 1 |
| 2 | 4 | 8 |
| 3 | 9 | 27 |
| 4 | 16 | 64 |
| 5 | 25 | 125 |
| 6 | 36 | 216 |
| 7 | 49 |  |
| 8 | 64 |  |
| 9 |  |  |
| 10 |  |  |
| 11 |  |  |
| 12 |  |  |
| 13 |  |  |
| 14 |  |  |
| 15 |  |  |
| 16 |  |  |
| 17 |  |  |
| 18 |  |  |
| 19 |  |  |
| 20 |  |  |
| 21 |  |  |







Quadrilateral

Square

Rectangle

Parallelogram

Isosceles Trapezoid

Trapezoid

Rhombus

Kite





 Here is a list of all the prime numbers up to 1,000:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 3 | 5 | 7 | 11 | 13 | 17 | 19 | 23 | 29 | 31 | 37 | 41 | 43 | 47 | 53 | 59 | 61 | 67 |
| 71 | 73 | 79 | 83 | 89 | 97 | 101 | 103 | 107 | 109 | 113 | 127 | 131 | 137 | 139 | 149 | 151 | 157 | 163 |
| 167 | 173 | 179 | 181 | 191 | 193 | 197 | 199 | 211 | 223 | 227 | 229 | 233 | 239 | 241 | 251 | 257 | 263 | 269 |
| 271 | 277 | 281 | 283 | 293 | 307 | 311 | 313 | 317 | 331 | 337 | 347 | 349 | 353 | 359 | 367 | 373 | 379 | 383 |
| 389 | 397 | 401 | 409 | 419 | 421 | 431 | 433 | 439 | 443 | 449 | 457 | 461 | 463 | 467 | 479 | 487 | 491 | 499 |
| 503 | 509 | 521 | 523 | 541 | 547 | 557 | 563 | 569 | 571 | 577 | 587 | 593 | 599 | 601 | 607 | 613 | 617 | 619 |
| 631 | 641 | 643 | 647 | 653 | 659 | 661 | 673 | 677 | 683 | 691 | 701 | 709 | 719 | 727 | 733 | 739 | 743 | 751 |
| 757 | 761 | 769 | 773 | 787 | 797 | 809 | 811 | 821 | 823 | 827 | 829 | 839 | 853 | 857 | 859 | 863 | 877 | 881 |
| 883 | 887 | 907 | 911 | 919 | 929 | 937 | 941 | 947 | 953 | 967 | 971 | 977 | 983 | 991 | 997 | [more...](https://www.mathsisfun.com/numbers/prime-numbers-to-10k.html) |