

PLACE VALUE

HdMill Ten Mill Mill HdThou TenThou Thou Hun Tens Ones

< > (Less than, greater than) always points to the smallest number.

FACTORS

The numbers you are multiplying. In $4 \times 5 = 20$, the factors are 4 and 5.

PRODUCT

The answer when you multiply. In $4 \times 5 = 20$, the product is 20.

MULTIPLES

All of the answers to a particular time table. For example, the multiples of 3 would be 3, 6, 9, 12, etc.

PRIME NUMBERS

A number with only two factors. For example 7 is a prime number because the only fact in which you can get the answer 7 is in 1×7 . So, 1 and 7 are its only factors.

EXPONENTS

Show that a number is being multiplied by itself. For example, 5^6 means $5 \times 5 \times 5 \times 5 \times 5 \times 5$.

NUMERATOR

The top (north) number of a fraction. In $\frac{3}{4}$, the 3 is the numerator.

DENOMINATOR

The bottom (down) number of a fraction. In $\frac{3}{4}$, the 4 is the denominator.

MEASUREMENT

Relating Metric Units

km \rightarrow m (multiply 1000)

m \rightarrow km (divide 1000)

m \rightarrow cm (multiply 100)

cm \rightarrow m (divide 100)

L \rightarrow mL (multiply 100)

mL \rightarrow L (divide 1000)

kL \rightarrow L (multiply 1000)

L \rightarrow kL (divide 1000)

m \rightarrow mm (multiply 1000)

mm \rightarrow m (divide 1000)

cm \rightarrow mm (multiply 10)

mm \rightarrow cm (divide 10)

kg \rightarrow g (multiply 1000)

g \rightarrow kg (divide 1000)

g \rightarrow mg (multiply 1000)

mg \rightarrow g (divide 1000)

In the metric system, to convert from a larger unit to a smaller unit, you need to multiply. To convert from a smaller unit to a larger unit, you need to divide. Big to Little, Multiply Little to Big, Divide

Relating Customary Units

ft \rightarrow in. (multiply 12)

in \rightarrow ft (divide 12)

yd \rightarrow in (multiply 36)

in \rightarrow yd (divide 36)

yd \rightarrow ft (multiply 3)

ft \rightarrow yd (divide 3)

mi \rightarrow ft (multiply 5280)

ft \rightarrow mi (divide 5280)

mi \rightarrow yd (multiply 1760)

yd \rightarrow mi (divide 1760)

cup \rightarrow oz (multiply 8)

oz \rightarrow cup (divide 8)

cup \rightarrow pt (divide 2)

pt \rightarrow cup (multiply 2)

qt \rightarrow pt (multiply 2)

pt \rightarrow qt (divide 2)

gal \rightarrow qt (multiply 4)

qt \rightarrow gal (divide 4)

gal \rightarrow pt (multiply 8)

pt \rightarrow gal (divide 8)

lb \rightarrow oz (multiply 16)

oz \rightarrow lb (divide)

T \rightarrow lb (multiply 2000)

lb \rightarrow T (divide 2000)

qt \rightarrow c (multiply 4)

c \rightarrow qt (divide 4)

$\frac{1}{2}$ lb = 8 oz

$\frac{1}{4}$ lb = 4 oz

$\frac{3}{4}$ lb = 12 oz

CONVERSIONS

English:

Length

12 inches (in) = 1 foot (ft)

36 in = 1 yd

3 ft = 1 yard (yd)

5280 ft = 1 mile (mi)

Weight

16 ounces (oz) = 1 pound (lb)

2000 lbs = 1 Ton (T)

Capacity

8 oz = 1 cup (c)

2 pt = 1 quart (qt)

2 c = 1 pint (pt)

4 qt = 1 gallon (gal)

Metric:

Length: 1 kilometer (km) = 1000 meters (m)

Weight: 1 gram (g) = 100 centigrams (cg)

Capacity: 1 liter (L) = 1000 milliliters (mL)

Conversion Line:

kilo hecto deka (unit) deci centi milli

*unit: Choose meter, Liter or gram for unit

English to Metric:

Length

1 m \approx 1.09 yd

1 ft \approx 30 cm

1 mi \approx 1.61 km

1 in \approx 2.54 cm

1 m \approx 3.28 ft

1 km \approx 0.62 mi

Weight

1 lb \approx 0.45 kg 1 g \approx 0.04 oz

1 kg \approx 2.2 lbs

1 oz \approx 28.35 g

Capacity

1 l \approx 0.26 gal

1 fluid oz \approx 29.57 mL

1 qt \approx 0.95 L

1 l \approx 1.06 qt

1 gal \approx 3.79 L

Temperature:

$$F^{\circ} = \frac{9}{5}C + 32$$

$$C^{\circ} = \frac{5(F-32)}{9}$$

Time Conversions:

1 year = 52 weeks

1 week = 7 days

1 day = 24 hours

1 hour = 60 minutes

1 minute = 60 seconds

LEAP Math Formulas

GEOMETRY

Perimeter:

Triangle: $P = a + b + c$

Rectangle: $P = 2l + 2w$

Circumference of Circle: $C = 2\pi r$ or $C = \pi d$
(Exact measures, use π Approximate; use 3.14)

Area:

Triangle: $A = \frac{1}{2}bh$

Rectangle: $A = lw$

Parallelogram: $A = bh$

Trapezoid: $A = \frac{1}{2}(b + B)h$

Circle: $A = \pi r^2$

Volume:

Rectangular Solid: $V = lwh$

Cone: $V = \frac{1}{3}\pi r^2 h$

Sphere: $V = \frac{4}{3}\pi r^3$

Circular Cylinder: $V = \pi r^2 h$

Square-based Pyramid: $V = \frac{1}{3}s^2 h$

Pythagorean Theorem: $a^2 + b^2 = c^2$

LINES

Slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Standard Form: $Ax + By = C$

Slope-Intercept Form: $y = mx + b$

Function Notation: $f(x) = mx + b$

Point-Slope Formula: $y - y_1 = m(x - x_1)$

OTHER FORMS

Direct Variation: $y = kx$

Standard Form of a Quadratic: $ax^2 + bx + c = 0$

Quadratic Formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Vertex (Ordered Pair): $\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right) \right)$

PERCENTAGES AND APPLICATION INFORMATION

Percent Increase/Decrease: $\frac{(\text{new number} - \text{original number})}{\text{original number}} \times 100\%$

Sales Tax: $\text{Tax} = \text{Rate} \cdot \text{Price}$

Total Price = Price + Tax

Commission: $\text{Commission} = \text{Rate} \cdot \text{Price}$

Total Commission = Price + Commission

Discount: $\text{Discount} = \text{Rate} \cdot \text{Price}$

Sales Price = Price - Discount

Simple Interest: $I = prt$ (time, yrs.)

Total Amount = Principal + Interest

Monthly Payments: $\text{Monthly Payment} = \frac{\text{Principal} + \text{Interest}}{\text{Total number of payments}}$

Distance: $d = rt$

Exponent Rule: $\sqrt[n]{a^m} = a^{\frac{m}{n}}$

Consecutive Integers: $x, x + 1, x + 2$

Consecutive Odd/Even Integers: $x, x + 2, x + 4$

1 quart

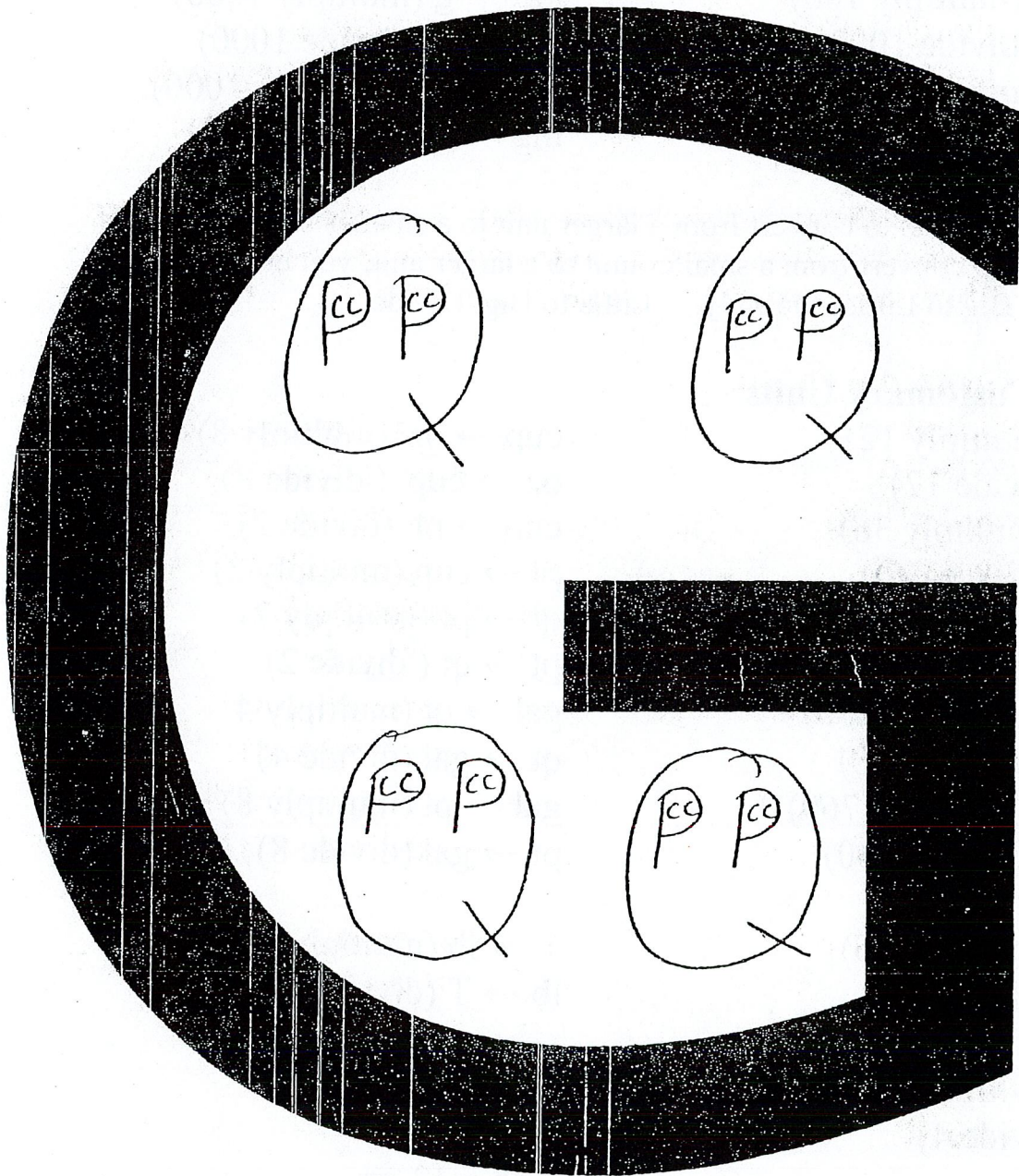
1 Gallon

4 Quarts

x 2 Pints

2 Cups

8 Fl Oz



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oz \rightarrow lb (divide)

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c \rightarrow qt (divide 4)

cup \rightarrow oz (multiply 8)
oz \rightarrow cup (divide 8)
cup \rightarrow pt (divide 2)
pt \rightarrow cup (multiply 2)
qt \rightarrow pt (multiply 2)
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gal \rightarrow qt (multiply 4)
qt \rightarrow gal (divide 4)
gal \rightarrow pt (multiply 8)
pt \rightarrow gal (divide 8)

T \rightarrow lb (multiply 2000)
lb \rightarrow T (divide 2000)

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1 minute = 60 seconds

Order of Operations Mnemonics

Please Excuse My Dear Aunt Sally.

Parenthesis ()

Exponents 5^2



Multiplication

Division



Use whichever
one comes first.

Addition

Subtraction



Use whichever
one comes first.

X \div **+** **-**

() , $\#^n$, X , \div , + , -

TIMES TABLE CHART

1
$1 \times 1 = 1$
$1 \times 2 = 2$
$1 \times 3 = 3$
$1 \times 4 = 4$
$1 \times 5 = 5$
$1 \times 6 = 6$
$1 \times 7 = 7$
$1 \times 8 = 8$
$1 \times 9 = 9$
$1 \times 10 = 10$
$1 \times 11 = 11$
$1 \times 12 = 12$

2
$2 \times 1 = 2$
$2 \times 2 = 4$
$2 \times 3 = 6$
$2 \times 4 = 8$
$2 \times 5 = 10$
$2 \times 6 = 12$
$2 \times 7 = 14$
$2 \times 8 = 16$
$2 \times 9 = 18$
$2 \times 10 = 20$
$2 \times 11 = 22$
$2 \times 12 = 24$

3
$3 \times 1 = 3$
$3 \times 2 = 6$
$3 \times 3 = 9$
$3 \times 4 = 12$
$3 \times 5 = 15$
$3 \times 6 = 18$
$3 \times 7 = 21$
$3 \times 8 = 24$
$3 \times 9 = 27$
$3 \times 10 = 30$
$3 \times 11 = 33$
$3 \times 12 = 36$

4
$4 \times 1 = 4$
$4 \times 2 = 8$
$4 \times 3 = 12$
$4 \times 4 = 16$
$4 \times 5 = 20$
$4 \times 6 = 24$
$4 \times 7 = 28$
$4 \times 8 = 32$
$4 \times 9 = 36$
$4 \times 10 = 40$
$4 \times 11 = 44$
$4 \times 12 = 48$

5
$5 \times 1 = 5$
$5 \times 2 = 10$
$5 \times 3 = 15$
$5 \times 4 = 20$
$5 \times 5 = 25$
$5 \times 6 = 30$
$5 \times 7 = 35$
$5 \times 8 = 40$
$5 \times 9 = 45$
$5 \times 10 = 50$
$5 \times 11 = 55$
$5 \times 12 = 60$

6
$6 \times 1 = 6$
$6 \times 2 = 12$
$6 \times 3 = 18$
$6 \times 4 = 24$
$6 \times 5 = 30$
$6 \times 6 = 36$
$6 \times 7 = 42$
$6 \times 8 = 48$
$6 \times 9 = 54$
$6 \times 10 = 60$
$6 \times 11 = 66$
$6 \times 12 = 72$

7
$7 \times 1 = 7$
$7 \times 2 = 14$
$7 \times 3 = 21$
$7 \times 4 = 28$
$7 \times 5 = 35$
$7 \times 6 = 42$
$7 \times 7 = 49$
$7 \times 8 = 56$
$7 \times 9 = 63$
$7 \times 10 = 70$
$7 \times 11 = 77$
$7 \times 12 = 84$

8
$8 \times 1 = 8$
$8 \times 2 = 16$
$8 \times 3 = 24$
$8 \times 4 = 32$
$8 \times 5 = 40$
$8 \times 6 = 48$
$8 \times 7 = 56$
$8 \times 8 = 64$
$8 \times 9 = 72$
$8 \times 10 = 80$
$8 \times 11 = 88$
$8 \times 12 = 96$

9
$9 \times 1 = 9$
$9 \times 2 = 18$
$9 \times 3 = 27$
$9 \times 4 = 36$
$9 \times 5 = 45$
$9 \times 6 = 54$
$9 \times 7 = 63$
$9 \times 8 = 72$
$9 \times 9 = 81$
$9 \times 10 = 90$
$9 \times 11 = 99$
$9 \times 12 = 108$

10
$10 \times 1 = 10$
$10 \times 2 = 20$
$10 \times 3 = 30$
$10 \times 4 = 40$
$10 \times 5 = 50$
$10 \times 6 = 60$
$10 \times 7 = 70$
$10 \times 8 = 80$
$10 \times 9 = 90$
$10 \times 10 = 100$
$10 \times 11 = 110$
$10 \times 12 = 120$

11
$11 \times 1 = 11$
$11 \times 2 = 22$
$11 \times 3 = 33$
$11 \times 4 = 44$
$11 \times 5 = 55$
$11 \times 6 = 66$
$11 \times 7 = 77$
$11 \times 8 = 88$
$11 \times 9 = 99$
$11 \times 10 = 110$
$11 \times 11 = 121$
$11 \times 12 = 132$

12
$12 \times 1 = 12$
$12 \times 2 = 24$
$12 \times 3 = 36$
$12 \times 4 = 48$
$12 \times 5 = 60$
$12 \times 6 = 72$
$12 \times 7 = 84$
$12 \times 8 = 96$
$12 \times 9 = 108$
$12 \times 10 = 120$
$12 \times 11 = 132$
$12 \times 12 = 144$