

GRADE 7 ONTARIO MATHEMATICS - JUMPMATH COMPANION

1. NUMBER SENSE AND NUMERATION

MULTIPLES AND FACTORS

Multiples are found from the times table of a number ; multiply the number by 0,1, 2 ..etc to generate multiples

e.g the multiples of 14 are 0, 14, 28, 42, ...etc

Factors of a number are numbers that divide into that number exactly .

e.g the factors of 14 are 1, 2, 7, and 14.

If you group them in pairs you will not miss any. For example the factors of 14 could be written

$$1 \times 14$$

$$2 \times 7$$

INTEGERS

Integers are whole numbers that can also be negative ,

e.g -2, -1, 0 , 1 , 2

PERFECT SQUARES AND SQUARE ROOTS

Perfect squares are numbers that are the result of a number times itself .Examples are 4, 9, 16., 25... because they can be written as 2×2 , 3×3 , 4×4 , 5×5 ...

Square roots are the single numbers that a square number comes from, eg. 2, 3, 4, 5, .

The square root of 81 for example is 9, because $9 \times 9 = 81$.

EXPONENTIAL NOTATION AND MEASUREMENT

Area is written in units squared (eg cm^2) because it is two dimension multiplied, ie.

Length x width

e.g A square of dimensions 3cm by 2cm is 6cm^2

Volume is 3 dimensions multiplied by each other so it written as units cubed, e.g cm^3

DIVIDING WHOLE NUMBERS BY FRACTIONS

To divide a number by a fraction, multiply but turn the fraction *upside down*.

e.g $7 \text{ divided by } \frac{2}{3} = 7 \times \frac{3}{2} = \frac{21}{2}$

DIVIDING WHOLE NUMBERS BY DECIMALS AND OTHER OPERATIONS

It is often easiest to move the decimal place on both numbers then divide as normal. eg. 60 divided by 0.05 can be rewritten as $600 / 5$ by multiplying both numbers by 100.

When multiplying by decimals multiply by the integers, then put the decimal place in afterwards.

e.g $5 \times 0.008 = 40 \times .001 = 0.040$

BEDMAS AND ORDER OF OPERATIONS

Brackets first, then exponents, then division and multiplication, then addition and subtraction

e.g $(4 - 2) \times 5^2 - 6 \times 2 = 2 \times 25 - 12$
 $= 50 - 12$
 $= 38$

OPERATIONS WITH FRACTIONS INVOLVING DIFFERENT DENOMINATORS

To add or subtract fractions you need the same denominators.

To get the same denominators you use common multiples.

For example to add $\frac{3}{4}$ to $\frac{5}{6}$ you would need to make both denominators 12, 12 being the LCM.

$\frac{3}{4}$ becomes $\frac{9}{12}$ because you have to multiply the fraction by 3 to get from 4 to 12.

$\frac{5}{6}$ becomes $\frac{10}{12}$ because you have to multiply the fraction by 2 to get from 6 to 12.

ADDING AND SUBTRACTING INTEGERS

Adding negative numbers to positive numbers is the same as subtraction. $5 + (-6) = -1$.

Adding only negative numbers is the same as addition except that you put a negative sign in front of the answer. e.g $-3 + -4 = -7$.

FRACTIONS, DECIMALS, PERCENTAGES

A fraction can be converted into a decimal by dividing the denominator into the numerator.

eg. $2/3 = 0.6666...$

To convert a decimal into a percentage, multiply by 100. eg. $0.66 = 66\%$

To convert percentages to fractions, put the number over 100. e.g $66\% = 66/100 = 33/50$

To convert decimals to fractions, put the number over the required number of decimal places. If there is 1 decimal place, put the number over 10. If there are 2 decimal places, put the number over 100, and so on.

eg. $0.6 = 6/10$ and $0.66 = 66/100$

RATIOS

Ratios can be treated like fractions.

The ratio 6 : 10 can be simplified as would be $6/10$

So, $6 : 10 = 3 : 5$

RATE is a ratio of different units.

For example if a car moves at speed 60km/h, this is the ratio 60km : 1 h

UNIT RATES AND PRICE COMPARISONS

are calculated by finding the rate of measurement to 1 of the other measurements.

For example, to compare 2 different size juice containers on value for money, find out how much each costs per 1 ml.

The large juice costs \$4.99 for 700ml, and the medium juice costs \$ 2.99 for 500ml.

For both juices, divide the price by the ml to get the unit rate of cost per ml.

Large : $499 / 700 =$

Medium : $299 / 500 =$