

# 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  $2 \times 2$ ,  $3 \times 3$ ,  $4 \times 4$ ,  $5 \times 5$ ...

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  $\text{cm}^2$  ) because it is two dimension multiplied, ie.

Length x width

e.g A square of dimensions 3cm by 2cm is  $6\text{cm}^2$

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

### **DIVIDING WHOLE NUMBERS BY FRACTIONS**

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

e.g  $7$  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.  $2/3 = 0.6666\dots$

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  $60\text{km/h}$ , this is the ratio  $60\text{km} : 1\text{h}$

## **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 :  $299 / 500 =$