

Year 6: Maths Knowledge Mat



Rounding

8,378,543

To the **nearest 10,000** is 8,380,000
 To the **nearest 100,000** is 8,400,000
 To the **nearest 1,000,000** is 8,000,000
 To the **nearest 10,000,000** is 10,000,000

Multiplying a fraction by a fraction

$$\frac{3}{5} \times \frac{6}{8} = \frac{3 \times 6}{5 \times 8} = \frac{18}{40}$$

$$\frac{3}{4} \times \frac{1}{3} = \frac{3 \times 1}{4 \times 3} = \frac{3}{12} = \text{reduces to } \frac{1}{4}$$

Percentages

On a calculator

36% of 76 \rightarrow Change to a decimal and multiply
 0.36×76

Increasing

Increase £70 by 14%
 14% of 70 = $0.14 \times 70 = £9.80$
 New amount = £70 + £9.80 = £79.80

Fraction to %

$$\frac{15}{20} = \frac{75}{100} = 75\%$$

Or $15 \div 20 \times 100 = 75\%$

Decreasing

Decrease £70 by 14%
 14% of 70 = $0.14 \times 70 = £9.80$
 New amount = £70 - £9.80 = £60.20

Without a calculator

50% - half
 25% - half and half
 75% - 50% + 25%

10% - divide by 10
 5% - half 10%
 20% - double 10%

Calculations with mixed numbers

Add Mixed Numbers

$$8\frac{1}{2} + 3\frac{3}{4}$$

$$= \frac{17}{2} + \frac{15}{4}$$

Change to improper fractions

$$= \frac{17 \times 2}{2 \times 2} + \frac{15}{4}$$

Change to common denominator

$$= \frac{34}{4} + \frac{15}{4}$$

$$= \frac{49}{4}$$

Add the numerators

$$= 12\frac{1}{4}$$

Change to mixed numbers

Subtract Mixed Numbers

$$8\frac{1}{2} - 4\frac{3}{4}$$

$$= \frac{17}{2} - \frac{15}{4}$$

Change to improper fractions

$$= \frac{17 \times 2}{2 \times 2} - \frac{15}{4}$$

Change to common denominator

$$= \frac{34}{4} - \frac{15}{4}$$

$$= \frac{19}{4}$$

Subtract the numerators

$$= 4\frac{3}{4}$$

Change to mixed numbers

Adding fractions

$$\frac{1}{2} + \frac{1}{3} = ?$$

$$\frac{1}{2} \times \frac{3}{3} = \frac{3}{6} \quad \frac{1}{3} \times \frac{2}{2} = \frac{2}{6}$$

$$\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$$

Mean Average

The sum of all data points divided by the number of data points

Formal methods of multiplication and division

134 x 27 becomes

	4	80	28
30		600	210
100		2 000	7 700

Total: 2 680 + 938 = 3 618

564 ÷ 15 becomes

15	5	6	4
	4	5	0
	1	1	4
	1	0	5
	3	7	

15 x 30

15 x 7

Remainders as fractions:

384 ÷ 11 becomes

$$11 \overline{) 384} \begin{array}{r} 34 \\ \underline{33} \\ 54 \\ \underline{55} \\ 4 \end{array} \text{ r10}$$

Answer: $34\frac{10}{11}$

BODMAS

B → Bracket
 O → Of
 D → Division
 M → Multiplication
 A → Addition
 S → Subtraction

BODMAS EXAMPLE

$$40 - (5 \times 2^2 + 7)$$

Brackets 1st then use ODMAS inside the brackets

$$40 - (5 \times 4 + 7) \quad (2^2)$$

$$40 - (20 + 7) \quad (\text{Multiply } 5 \times 4)$$

$$40 - 27 \quad (\text{Add } 20 + 7)$$

Answer = 13

Ratio

Ratio compares values.
 A **ratio** says how much of one thing there is compared to another thing.
Ratio 3:1. There are 3 blue squares to 1 yellow square.

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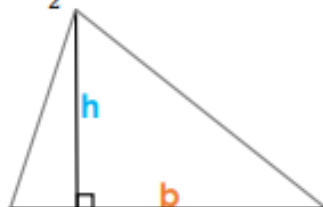
Algebra

One step equation e.g. $y + 14 = 20$
 Undo addition or subtraction
 $y = 6$

Two step equation e.g. $2x + 5 = 11$
 Undo addition or subtraction
 $2x = 6$
 Undo multiplication or division
 $x = 3$

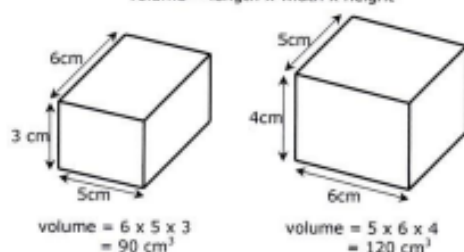
Area of a triangle

$$\text{Area} = \frac{1}{2} \times b \times h = \frac{bh}{2}$$

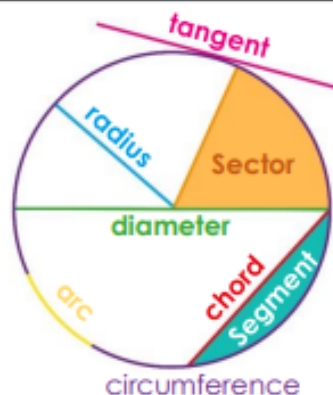


Volume

volume = length x width x height



Circles



The **diameter** is twice the **radius**

Angles in a triangle



$$a^\circ + b^\circ + c^\circ = 180^\circ$$

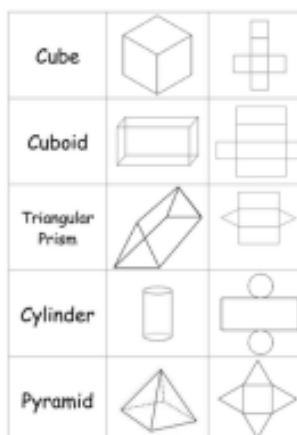


$$38^\circ + 60^\circ + c^\circ = 180^\circ$$

$$c^\circ = 180^\circ - 98$$

$$c^\circ = 82^\circ$$

Nets of 3D shapes



Square Numbers

Square Numbers	Square Roots
1^2	1
2^2	4
3^2	9
4^2	16
5^2	25
6^2	36
7^2	49
8^2	64
9^2	81
10^2	100
11^2	121
12^2	144
13^2	169

Cube Numbers

Cube Numbers	Cube Roots
1^3	1
2^3	8
3^3	27
4^3	64
5^3	125

Vocabulary

factors	numbers that you multiply together to get other numbers
multiple	the result of multiplying a number by an integer
HCF	Highest Common Factor - the largest factor shared by two or more numbers
LCM	Lowest Common Multiple - the smallest number that is a multiple of two or more numbers.