

YEAR 7 SPRING 1

1) Addition and Subtraction

Methods of addition and subtraction with decimals (N13, N14)

Solve perimeter-based problems

Application of number to completing and reading from frequency trees and bar and line charts

Add and subtract in standard form

2) Multiplication and Division

Multiplication and division using a formal written method (integers) (N15, N16, N28, N29)

Multiplying and dividing by powers of 10

Multiply and divide by 0.1 and 0.01 (N17a, b)

BODMAS (N20)

Solve area based problems

Problems involving the mean (S6)

3) Fractions and Percentages of amounts

Find fractions of amounts (N33)

Convert between fractions and Percentages (N32)

Find percentages of amounts (calculator and non calculator) (N24a, b)

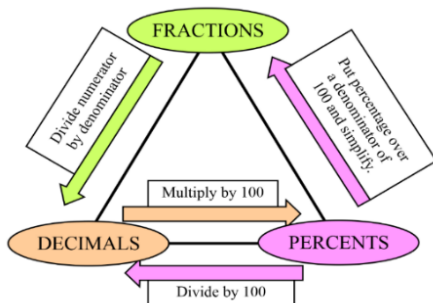
Solve percentage problems

keyfacts

Brackets
Indices
Division
Multiplication
Addition
Subtraction

Follow the order of BIDMAS to calculate

If you can do nothing for a given step, move on to the next



Addition and Subtraction

Perimeter means the distance around a shape.

What is the perimeter of this triangle?



BIDMAS/BODMAS

Example 1

$$\begin{aligned}
 &6 + 3 \times 4 \\
 &\text{Multiplication first} \\
 &= 6 + \boxed{3 \times 4} \\
 &\text{Addition second} \\
 &= \boxed{6 + 12} \\
 &= 18
 \end{aligned}$$

Example 3

$$\begin{aligned}
 &(9 - 3 \times 2)^2 \div (10 \div 5) \\
 &= \boxed{(9 - 3 \times 2)^2} \div \boxed{(10 \div 5)} \\
 &= \boxed{(3)^2} \div \boxed{(2)} \\
 &= \boxed{9 \div (2)} \\
 &= 4.5
 \end{aligned}$$

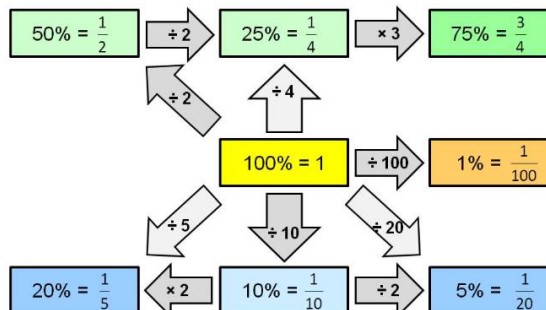
Follow the order of operations within brackets

Example 2

$$\begin{aligned}
 &3 + 8 \times (4 + 6) \div 5 - 2 \\
 &\text{Brackets first} \\
 &= 3 + 8 \times \boxed{(4 + 6)} \div 5 - 2 \\
 &\text{Multiplication and Division second} \\
 &= 3 + \boxed{8 \times 10 \div 5} - 2 \\
 &\text{Addition and Subtraction last} \\
 &= \boxed{3 + 16 - 2} \\
 &= 17
 \end{aligned}$$

Fractions and Percentages of amounts

Fractions of Amounts – Divide by the denominator and multiply by the numerator



Adding and subtracting decimals is just like adding and subtracting whole numbers.



Just remember to line up the decimal points...

$$\begin{array}{r}
 \text{X} \quad 5.6 \\
 + \quad 3.72 \\
 \hline
 ?
 \end{array}
 \quad
 \begin{array}{r}
 \text{✓} \quad 5.6 \\
 + \quad 3.72 \\
 \hline
 9.32
 \end{array}
 \quad
 \begin{array}{r}
 \text{✓} \quad 8.73 \\
 - \quad 2.52 \\
 \hline
 6.21
 \end{array}$$

... and don't forget to write the decimal point in your answer!

Multiplication and Division

Multiplying Decimals: 13.75×5.5

Dividing Decimals: $13.75 \div 5.5$

forget about decimal points and multiply

set up division

move both decimal points until the divisor is an integer

move up decimal point

usual long division!

decimal places of the first number + # decimal places of the second number = # decimal places of the third number

2 d.p. + 1 d.p. = 3 d.p.

YEAR 7 SPRING 2

1) Operations and Solving Equations involving Directed Number.

- Ordering directed number.
- Use zero pairs to perform calculations that cross zero.
- Add and Subtract directed numbers.
- Collect like terms with directed numbers
- Solve equations involving directed number.

2) Addition and Subtraction of Fractions

- Converting between improper and mixed numbers.
- Add and Subtract fractions with a common denominator.
- Add and Subtract fractions with different denominators.
- Apply your understanding to mixed numbers.

Operations and Solving Equations involving Directed Number

$$++ = +$$

$$3 + +4 = +7$$

$$-2 + +8 = +6$$

$$-- = +$$

$$3 - -4 = +7$$

$$-2 - -8 = +6$$

$$+- = -$$

$$3 + -4 = -1$$

$$-2 + -8 = -10$$

$$-+ = -$$

$$3 - +4 = -1$$

$$-2 - +8 = -10$$

Multiplying

$$+ \times + = +$$

$$+ \times - = -$$

$$- \times + = -$$

$$- \times - = +$$

Dividing

$$+ \div + = +$$

$$+ \div - = -$$

$$- \div + = -$$

$$- \div - = +$$

If the signs are the **SAME** the answer is **POSITIVE**
If the signs are **DIFFERENT** the answer is **NEGATIVE**

Collecting Like Terms

$$a + 7a - 3a =$$

$$a + 7a - 3a =$$

$$8a - 3a =$$

$$5a$$

$$9b + a - 5b =$$

$$9b + a - 5b =$$

$$9b - 5b + a =$$

$$4b + a$$

Solving Equations with Negatives

$$b) \quad 8 - 5x = 13$$

$$d) \quad 19 = 4 - 5x$$

$$f) \quad 14 = 3 - 11x$$

$$-5x = 5$$

$$x = -1$$

$$15 = -5x$$

$$x = -3$$

$$11 = -11x$$

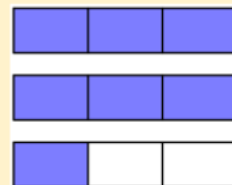
$$x = -1$$

Fractions

Improper Fraction

Numerator > Denominator

$$\frac{7}{3}$$



Mixed Number

$$2\frac{1}{3}$$

Add or Subtract "+ or -" with common denominators

Add the numerators, denominator stays the same. EXAMPLE:

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

Add or Subtract "+ or -" with different denominators

Change to equivalent fractions with common denominators, then add. EXAMPLE:

$$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$$

$$1. \quad \frac{3x}{2} + \frac{4x}{5}$$

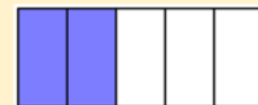
$$2. \quad \frac{x}{2} + \frac{4x}{5}$$

$$3. \quad \frac{x}{2} + \frac{x}{5}$$

Proper Fraction

Numerator < Denominator

$$\frac{2}{5}$$



keyfacts

The number of pieces.

3
—
4

Amount the whole is split into.

Brackets
Indices
Division
Multiplication
Addition
Subtraction

ORDER
↓

Follow the order of BIDMAS to calculate

If you can do nothing for a given step, move on to the next

YEAR 7 SUMMER 1

1) Measuring and using geometric notation

Estimating, naming, drawing angles (G10a, G10b, G10c)

Identify perpendicular and parallel lines, types of triangles and polygons

2) Developing Geometric Reasoning

Angles on a line, around a point, vertically opposite angles (G13)

Angles in triangles (G16,17)

Mixed multi step angle questions

3) Probability

Use vocabulary relating to probability and the probability scale (P1)

List outcomes to and event systematically, and use a sample space (P2)

Calculate single event probability and know that probabilities add up to 1 (P3)

Draw and use Venn diagrams to calculate probability (P6)

Complete and use a two way table to calculate probability (P4,5)

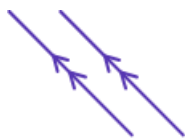
keyfacts

Angles on a **straight-line** add up to **180°**

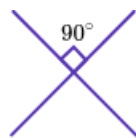
Angles around a **point** add up to **360°**

Vertically opposite angles are **equal**

Measuring and using geometric notation



Parallel Lines



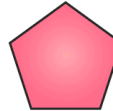
Perpendicular Lines



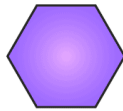
Triangle



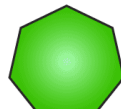
Quadrilateral



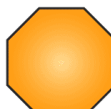
Pentagon



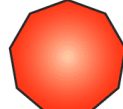
Hexagon



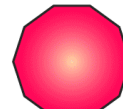
Heptagon



Octagon



Nonagon



Decagon

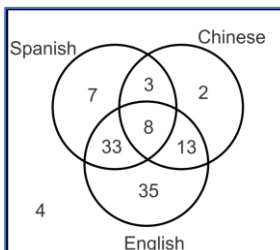
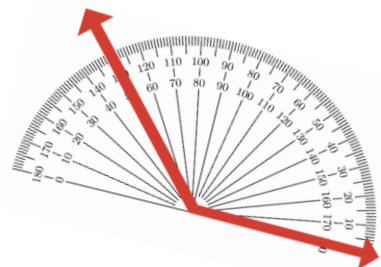
Probability



1) What is the probability that a bead chosen will be **yellow**.
Show the answer on a number line.

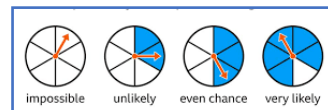
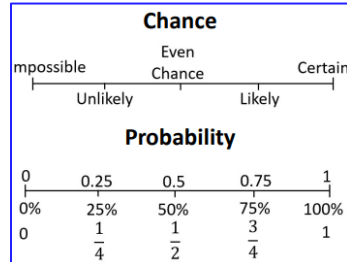
$$\text{Probability} = \frac{\text{Number of favourable outcomes}}{\text{Total number of outcomes}}$$

$$P(\text{Yellow}) = \frac{2}{8} = \frac{1}{4}$$

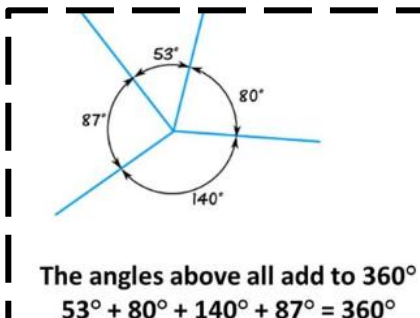
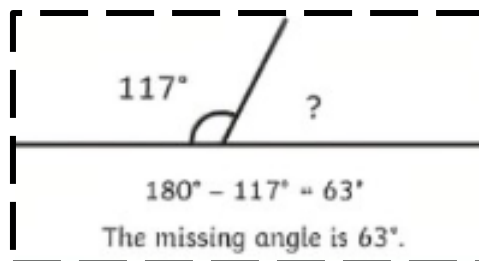
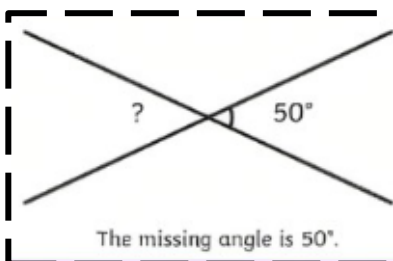


The probability of studying Spanish and Chinese is

$$\frac{3+8}{105} = \frac{11}{105}$$



Developing Geometric Reasoning



YEAR 7 SUMMER 2

1) Prime Numbers and Proof

Recognise and identify prime numbers, square numbers and triangular numbers (N10,11,30a)

Find and use multiples and Identify factors of numbers and expressions

Find common multiples of a set of numbers including the LCM (N31a)

Find common factors of a set of numbers including the HCF (N31b)

Write a number as a product of its prime factors (N30b)

Use a Venn diagram to calculate the HCF and LCM of numbers

2) Developing Number Sense

Mental addition and subtraction - integers

Mental multiplication and division – integers (N15, N28)

Mental arithmetic strategies for decimals (N13,14,15)

Mental arithmetic strategies for fractions

3) Sets and Venn Diagrams

Identify and represent sets

Interpret and create Venn diagrams

Understand and use sets

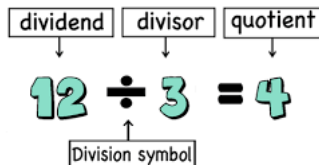
4) Construction

Construct triangles

Construct more complex polygons

keyfacts

Square Numbers



$$\begin{aligned} 1 \times 1 &= 1 \\ 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \end{aligned}$$

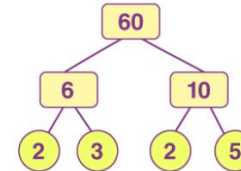
Prime Numbers and Proof

LCM

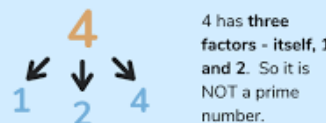
Lowest common multiple

The smallest number that occurs in the times table of two or more numbers.

Prime Factor Tree



How do prime numbers work?



Think Addition

$$8 - 3 =$$

THINK:

$$3 + \underline{\quad} = 8$$

$$3 + 5 = 8, \text{ so}$$

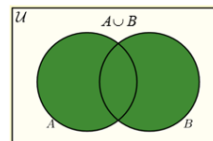
$$8 - 3 = 5$$

I thought of the problem as '3 add what gives me 8?' I started at 3 and jumped up 5 to get to the 8. So I knew that the difference between 8 and 3 is 5.

Subtraction

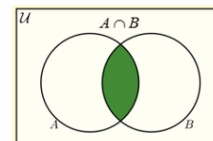
Sets and Venn Diagrams

Venn Diagrams



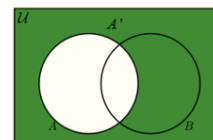
$A \cup B$

Elements that belong to either A or B or both.



$A \cap B$

Elements that belong to both A and B.

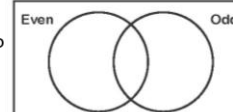


A'

Elements that don't belong to A.

Even = {2, 4, 6, 8, 10}

Odd = {1, 3, 5, 7, 9}



A Even $\cup$ Odd = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

B Even $\cup$ Odd = {0}

C Even $\cup$ Odd = {1, 2, 5, 8}

HCF

Highest common factor

The largest number that divides into two or more numbers

Use long format of Prime Factor Decomposition

Developing Number Sense

Break Apart the Subtrahend (2nd number)

$$10 - 6 =$$

$$5 + 1$$

$$10 - 5 = 5$$

$$5 - 1 = 4, \text{ so}$$

$$10 - 6 = 4$$

I split 6 into 5 and 1. I took 5 away from 10 to get 5. Then I took 1 away from 5 to get 4. So $10 - 6 = 4$.

Subtraction

Same Difference

$$8 - 2 =$$

$$+2 \quad +2$$

$$10 \quad 4$$

$$10 - 4 = 6$$

$$\text{so}$$

$$8 - 2 = 6$$

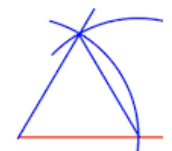
The difference between 10 and 4 is 6.

The difference between 8 and 2 is also 6.

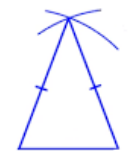
Subtraction

Construction

Construct Triangles



Equilateral Triangle



Isosceles Triangle