# Y9 ESSENTIAL KNOWLEDGE / LITERACY (LAGRANGE)

(LEARN THIS KEY INFORMATION FROM PREVIOUS YEARS)
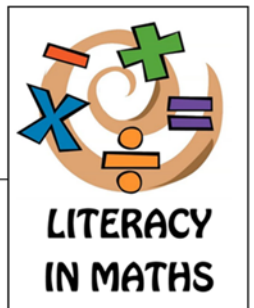
| | |
|---|---|
| 1. | A **ratio** is the relationship between two or more numbers that are separated by a colon |
| 2. | **π** (or **pi**) is a constant that is the ratio of a circle's circumference to its diameter (approximately 3.14) |
| 3. | The general form of the equation for a straight line is **y = mx + c** |
| 4. | In y = mx + c, **m** represents the **gradient** (the steepness of the line) |
| 5. | In y = mx + c, **c** represents the **y-intercept** (where the line crosses the y-axis) |
| 6. | A **negative gradient** represents a line going "down-hill"<br><br>Positive Gradient      Negative Gradient |
| 7. | **Direct proportion**; as one amount increases, another amount increases at the same rate. |
| 8. | An **improper fraction** is a 'top-heavy' fraction, the numerator is larger than the denominator. For example, $\dfrac{9}{4}$ |
| 9. | A **mixed number** is a number made up of whole's and fractional parts. For example, $5\dfrac{3}{7}$ |
| 10. | **Similar** shapes in maths are enlargements of each other, their lengths are in direct proportion. (Angles remain the same in similar shapes) |
| 11. | A **scale factor** tells us what multiplier has been used to enlarge a shape (remember enlargements can get smaller too, with scale factors between 0 and 1) |
| 12. | A **map scale** is often written in the form 50 000:1, this means 1 cm on the map is equivalent to 50 000cm in real life. |
| 13. | To **multiply fractions** together, multiply the numerators together and the denominators together. |
| 14. | To **divide fractions** together, use **KFC**. **Keep** the first fraction the same, **Flip** the second fraction over (this is also the reciprocal of the fraction), **Change** the sign to a multiply, then work it out.<br><br>$\dfrac{1}{2} \div \dfrac{1}{4}$<br>KEEP  CHANGE  FLIP<br>$\dfrac{1}{2} \times \dfrac{4}{1}$ |
| 15. | A **reciprocal** is 1 divided by the number given, or when given as a fraction the numerator and denominator switch places. |

2 : 3

LITERACY IN MATHS

Know

| 16. | A **coordinate** is used to identify a location on a grid. We give the x-value first, then the y-value, and it is written in brackets. |
| --- | --- |

| 17. | We use a **scatter graph** to see if two variables have a relationship. |
| --- | --- |
| 18. | **Correlation** tells us what that relationship might be, they can show either: |



Positive Correlation    Negative Correlation    No Correlation

| 19. | **Continuous** data can take any value, often it will be a measurement. |
| --- | --- |
| 20. | **Discrete** data can only take certain values, like shoe sizes. |
| 21. | **Qualitative** data use words instead of numbers, like someone's favourite colour. |
| 22. | A **sequence** is a set of numbers that follow a rule to get from one number to the next. |
| 23. | A **formula** is a rule written using symbols that represents different amounts. For example, the area of a triangle can be found with the formula $A = \dfrac{bh}{2}$ |
| 24. | An **expression** is a collection of algebraic terms that are being added or subtracted together. |
| 25. | An **equation** shows that two things are equal. |
| 26. | An **identity** is true no matter what values are chosen. For example, $3(x + 5) \equiv 3x + 15$. $\equiv$ is the mathematical symbol for an identity. |
| 27. | To **expand** an expression means to multiply out the brackets. |

Expand the following expression
$3(x - 9)$

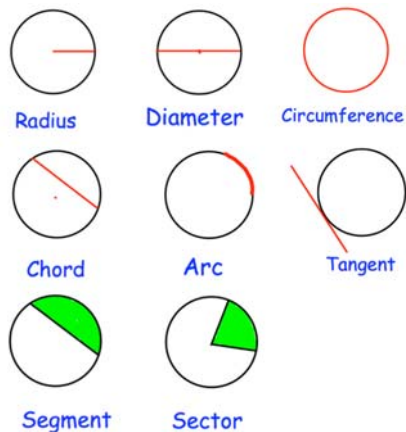|   | x  | - 9 |
|---|----|-----|
| 3 | 3x | -27 |

Final Ans:    3x -27

| 28. | To **factorise** an expression is the reverse of expanding. So factorising 3x-27 gives 3(x-9). For it to be fully factorised we must have the highest common factor in front of the bracket. |
| --- | --- |
| 29. | **Inequalities…** |

Greater than $>$    Greater than or equal to $\geq$

Less than $<$    Less than or equal to $\leq$

| 30. | **Parts** of a **Circle…** |
|---|---|



Radius    Diameter    Circumference

Chord    Arc    Tangent

Segment    Sector

| 31. | Know these key equivalent fractions, decimals and percentages… |
|---|---|

| Fraction | Decimal | Percentage |
|---|---|---|
| $\frac{1}{1}$ | 1 | 100 |
| $\frac{1}{2}$ | 0.5 | 50 |
| $\frac{1}{4}$ | 0.25 | 25 |
| $\frac{1}{5}$ | 0.2 | 20 |
| $\frac{1}{10}$ | 0.1 | 10 |
| $\frac{1}{20}$ | 0.05 | 5 |
| $\frac{1}{100}$ | 0.01 | 1 |

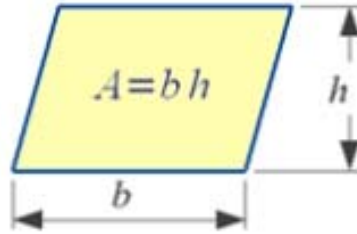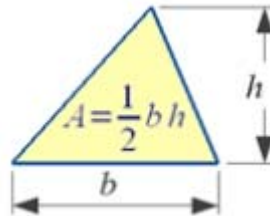| 32. | Laws of indices, multiplying: $a^m \times a^n = a^{m+n}$ |
|---|---|
| 33. | Laws of indices, dividing: $a^m \div a^n = a^{m-n}$ |
| 34. | **Percentage multipliers** use decimal equivalents of percentages and multiplication to calculate amounts. For example, the percentage multiplier for 63% is x0.63 |
| 35. | A number written in **standard form** is a number written between 1 and 10 multiplied by 10 to an appropriate power. We use standard form to represent very large or very small numbers. For example, $0.00032 = 3.2 \times 10^{-4}$, $320000 = 3.2 \times 10^5$ |
| 36. | **Angles on parallel lines…** |



**Corresponding angles** are equal
$a = b$
Look for an F-shape

**Alternate angles** are equal
$a = b$
Look for a Z-shape
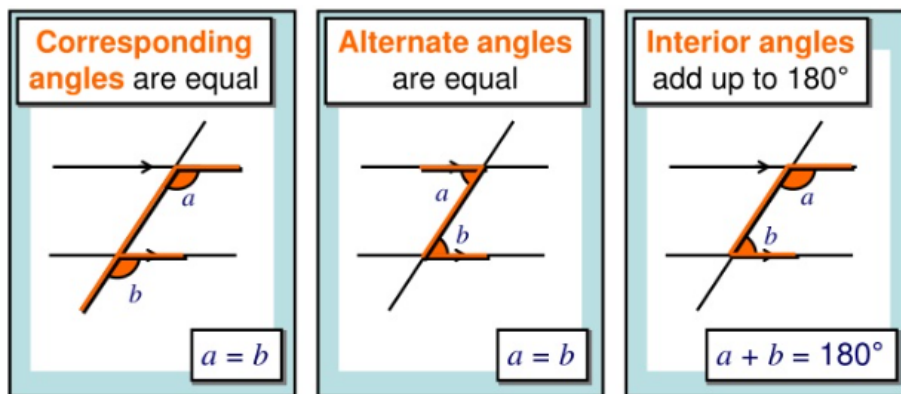
**Interior angles** add up to 180°
$a + b = 180°$
Look for a C- or U-shape
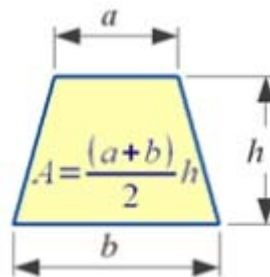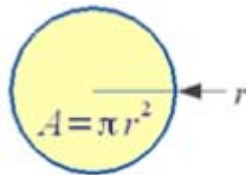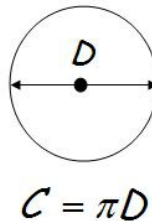
| | | |
|---|---|---|
| 37. | **Area** of a **parallelogram and rectangle**… $A = bh$ | Know |
| 38. | **Area** of a **triangle**… $A = \frac{1}{2}bh$ | |
| 39. | **Area** of a **trapezium**… $A = \frac{(a+b)}{2}h$ | |
| 40. | **Area** of a **circle**… $A = \pi r^2$ | |
| 41. | **Circumference** of a **circle**… $C = \pi D$ | |
| 42. | The **range** is the largest number subtract the smallest number. | |
| 43. | The **mode** is the most common number. | |
| 44. | The **median** is the middle number, when put in order. | |
| 45. | The **mean** is the total of all the numbers divided by the amount of numbers. | |