|  |
| --- |
| A ***formula*** is a mathematical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that relates two or more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  **KEY WORDS**  Equation  Variables  Profit  tickets  backward  numerical  formula(s)  forward  convert  substitute   * ***P* =25*T* –800** might give the profit from ticket sales, where ***P*** is the **\_\_\_\_\_\_** and ***T*** is the **# of** **\_\_\_\_\_\_\_ sold** * ***E = mc2*** (Einstein’s theory of relativity) relates **Energy** to the **Mass** of an object and the **Speed of light**   **Solving Multi-Step Problems – Plan and organize your solution**   * ***PLAN*** your solution by working \_\_\_\_\_\_\_\_\_\_\_from what you are trying to find to what you are given   + Determine what \_\_\_\_\_\_\_\_\_\_\_\_\_ info is given and what you need to find   + Decide what \_\_\_\_\_\_\_\_\_\_\_ to use * ***WRITE*** the solution by working \_\_\_\_\_\_\_\_\_ from what you are given to what you are trying to find   + \_\_\_\_\_\_\_\_ quantities to similar units (if necessary)   + \_\_\_\_\_\_\_\_\_\_ known values (given or calculated) to solve for the unknown |

**EXAMPLE 1 *– SUBSTITUTING***

The formula ***S = 0.6T + 331.5*** gives the approximate speed of sound in air, ***S*** metres per second, when the temperature is ***T*** degrees Celsius. Determine the speed of sound at -40 oC.

Start with the formula 🡪

Substitute given values 🡪

Solve to find the answer 🡪

Write a therefore statement 🡪

**EXAMPLE 2 *– CHOOSING FORMULAS & CONVERTING MEASURES***

A landscaper uses a bucket with radius 18 cm and height 18 cm to pour soil into a rectangular planter measuring 1.2 m by 40 cm by 20 cm. How many buckets of soil are needed to fill the planter?

Convert measures 🡪

**Planter** **Bucket**

Decide on formulas to use 🡪

Substitute given values 🡪

Solve the problem 🡪

Write a final statement 🡪

***EXAMPLE 3 – MULTI-STEP PROBLEMS***

A landscaper wants to estimate the cost of fertilizing a triangular lawn with side lengths 150 m, 200 m, and 300 m. One bag of fertilizer costs $19.98 and covers an area of 900 m2. She uses Heron’s formula to determine the area of the lawn: The area A of a triangle with side lengths a, b, and c, is given by , where . Estimate the cost to fertilize the lawn.

**PLAN the solution: Work backwards**

To find the cost of \_\_\_\_\_\_\_\_\_\_\_\_\_\_, I need to know the number of \_\_\_\_\_\_\_\_\_ needed

To find the ***# of bags needed*** I need to know the area of the \_\_\_\_\_\_\_

To find the ***area of the lawn*** I need to use the formula for the \_\_\_\_\_\_\_\_\_

To use the ***formula for area*** I need to know the value of “s”

To find the ***value of s*** I need to know the lengths of sides a, b, c

**WRITE the solution: Work forwards**

Find s:

Find A:

Find # bags needed:

Find cost: