Guide to:
Function machines

maths Links

Explanation:

To find the **output** of a function machine, start with the input and apply each operation in order from left to right. To find the **input** when given the output, work **backwards from right to left** using the **inverse (opposite)** operations (+ becomes −, × becomes ÷).

When the input is a letter x, write the algebraic result after each box to form an expression or equation.



Example 1: Using the machine above:
(a) Find the output when the input is **6**.
(b) Find the input when the output is **29**.

(a) Forward: 6 × 4 = 24, then 24 − 7 = **17**
(b) Reverse with inverse operations (+ 7, then ÷ 4):
• 29 + 7 = 36, then 36 ÷ 4 = **9**

Example 2: Using the machine above:
(a) Write the output when the input is x.
(b) Find x when the output is equal to $x + 20$.

(a) $x \rightarrow 4x \rightarrow \mathbf{4x - 7}$
(b) Solve $4x - 7 = x + 20 \rightarrow 3x = 27 \rightarrow \mathbf{x = 9}$

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ken@mathslinks.co.uk