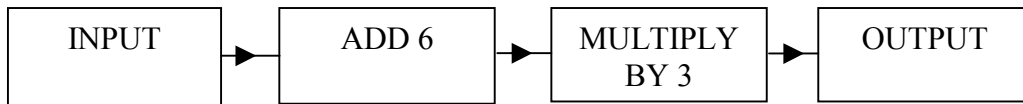
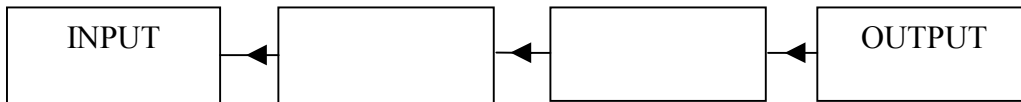


NUMBER MACHINES

1)



- a) Calculate the output when a value of 4 is input into the above flowchart.
- b) Copy and complete the following flowchart which **inverts** (reverses) the above flowchart.



Use **your new** flowchart to find which number needs to be inputted to give an output of 24 ?

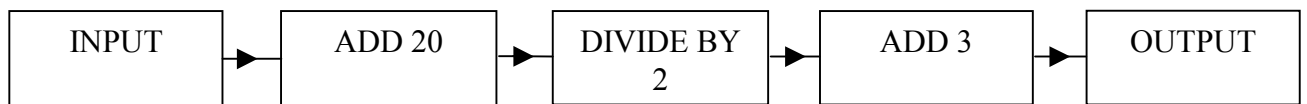
- c) If we write the input as the number x , what is the value of the output?
Write your answer as a formula involving x .
- d) Use your formula in c) to check the answer in a).

2)

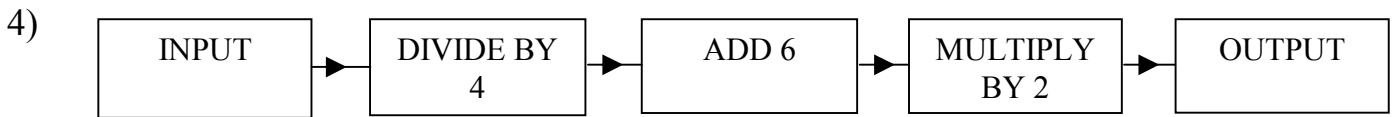


- a) Calculate the output when a value of 10 is input into the above flowchart.
- b) Which number needs to be inputted to give an output of 43 ? **(Hint: invert the flowchart!)**
- c) If we write the input as the number x , what is the value of the output?
Write your answer as a formula involving x .
- d) Use your formula in c) to check the answer in a).

3)



- a) Calculate the output when a value of 6 is input into the above flowchart.
- b) Which number needs to be inputted to give an output of 19 ?
- c) If we write the input as the number x , what is the value of the output?
Write your answer as a formula involving x .
- d) Use your formula in c) to check the answer in a).



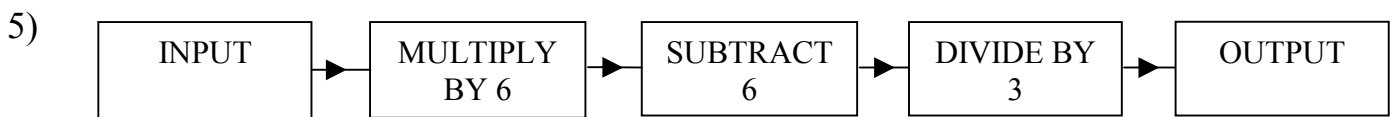
a) Calculate the output when a value of 8 is input into the above flowchart.

b) Which number needs to be inputted to give an output of 22 ?

c) If we write the input as the number x , what is the value of the output?

Write your answer as a formula involving x .

d) Use your formula in c) to check the answer in a).



a) Calculate the output when a value of 5 is input into the above flowchart.

b) Which number needs to be inputted to give an output of 14 ?

c) If we write the input as the number x , what is the value of the output?

Write your answer as a formula involving x .

d) Use your formula in c) to check the answer in a).

6) Copy and complete the following statements to show the inverse (reverse) operations. The first 2 are done for you. **(You might find it helpful to draw some flowcharts etc.)**

a) The inverse of multiplying by 2 is ANSWER: dividing by 2.

b) The inverse of adding 5 is ANSWER: subtracting 5.

c) The inverse of dividing by 10 is

d) The inverse of subtracting 12 is

e) The inverse of multiplying by 5 followed by adding 3 is

f) The inverse of multiplying by 8 followed by subtracting 5 is

g) The inverse of adding 4 followed by multiplying by 5 is

h) The inverse of subtracting 12 followed by dividing by 2 is

i) The inverse of adding 100 followed by multiplying by 5 followed by subtracting 7 is

j) The inverse of multiplying by 6 followed by subtracting 12 followed by dividing 2 is

ANSWERS.

1) a) 30, b) 2, c) $3(x + 6)$.

2) a) 28, b) 13, c) $5(x - 5) + 3$.

3) a) 16, b) 12, c) $\frac{(x + 20)}{2} + 3$.

4) a) 16, b) 20, c) $2\left(\frac{x}{4} + 6\right)$.

5) a) 8, b) 8, c) $\frac{(6x - 6)}{3}$.

6) c) multiplying by 10, d) adding 12, e) subtracting 3 followed by dividing by 5, f) adding 5 followed by dividing by 8, g) dividing by 5 followed by subtracting 4, h) multiplying by 2 followed by adding 12, i) adding 7 followed by dividing by 5 followed by subtracting 100, j) multiplying by 2 followed by adding 12 followed by dividing by 6.