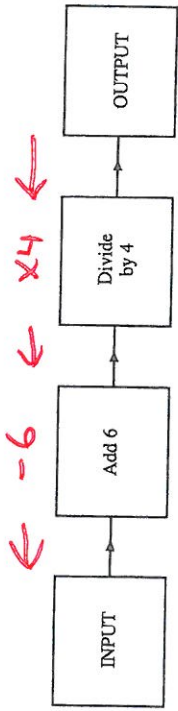


NUMBER MACHINES & CONTEXT FORMULAS PPG!

①

(a) The diagram below represents a number machine.



(i) When the INPUT is 14, what is the OUTPUT?

$$14 + 6 = 20 \div 4 = 5 \frac{2}{2}$$

(ii) When the OUTPUT is 7, what is the INPUT?

$$7 \times 4 = 28 - 6 = 22 \frac{2}{3}$$

[3]

②

(a) The diagram below represents a number machine.



(i) When the INPUT is 14, what is the OUTPUT?

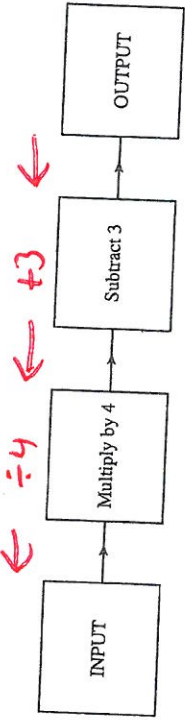
$$14$$

(ii) When the OUTPUT is 7, what is the INPUT?

[3]

③

(a) The diagram below represents a number machine.



(i) When the INPUT is 8, what is the OUTPUT?

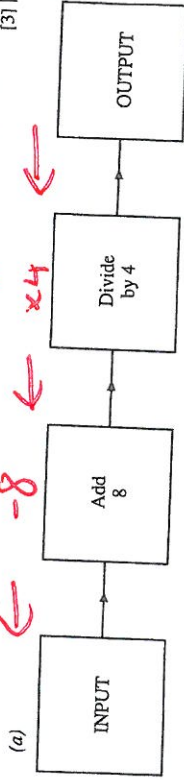
$$8 \times 4 = 32 - 3 = 29 \frac{2}{3}$$

(ii) When the OUTPUT is 17, what is the INPUT?

$$17 + 3 = 20 \div 4 = 5 \frac{2}{3}$$

[3]

④



(i) Find the value of the OUTPUT when the INPUT is 12.

$$12 + 8 = 20 \div 4 = 5 \frac{2}{3}$$

[1]

(ii) Find the value of the INPUT when the OUTPUT is 10.

$$10 \times 4 = 40 - 8 = 32 \frac{2}{3}$$

[2]

5. (a) Janet thinks of a number. She divides her number by 6 and adds 10. The answer she gets is 14. What number did Janet think of?



$$14 - 10 = 4 \times 6 = 24 \frac{2}{3}$$

[2]

6

A person's weekly wage is worked out using the formula

$$\text{Wage} = \text{Number of hours of overtime} \times \text{£15} + \text{Basic pay}$$

- (a) Find a person's Wage when the Number of hours of overtime is 7 and the Basic pay is £150.

$$\begin{aligned} W &= 7 \times 15 + 150 \\ &= 105 + 150 = \text{£}255 \end{aligned}$$

[2]

- (b) Find the Number of hours of overtime, when the Wage is £270 and the Basic pay is £180.

$$\begin{aligned} 270 &= N \times 15 + 180 \\ 270 - 180 &= N \times 15 \\ 90 \div 15 &= N \quad \text{So } 6 \text{ hours overtime} \\ 6 &= N \end{aligned}$$

[2]

The formula for the cost of buying a television on credit is

$$\text{Cost of buying a television} = 36 \times \text{Monthly payment} + \text{Deposit}$$

- (a) Find the Cost of buying a television when the Monthly payment is £40 and the Deposit is £30.

$$\begin{aligned} C &= 36 \times 40 + 30 \\ &= 1440 + 30 \\ &= \text{£}1470 \end{aligned}$$

[2]

- (b) Find the Deposit, when the Cost of buying a television is £1330 and the Monthly payment is £35.

$$\begin{aligned} 1330 &= 36 \times 35 + D \\ 1330 &= 1260 + D \\ 1330 - 1260 &= D \\ 70 &= D \end{aligned}$$

$$\text{So Deposit} = \text{£}70$$

[2]

8

The formula for the cost of getting a person to do repairs is

$$\text{Cost} = \text{Number of hours} \times \text{£}25 + \text{Call Out Charge}$$

- (a) Find the Cost when the Number of hours is 5 and the Call Out Charge is £50.

$$\begin{aligned} C &= 5 \times 25 + 50 \\ C &= 125 + 50 \\ C &= \text{£}175 \end{aligned}$$

[2]

- (b) Find the Call Out Charge, when the Cost is £240 and the Number of hours is 8.

$$\begin{aligned} 240 &= 8 \times 25 + C \\ 240 &= 200 + C \\ 240 - 200 &= C \\ 40 &= C \quad \text{So call out charge} = \text{£}40 \end{aligned}$$

[2]

9

The formula for the cost of printing books is

$$\text{Printing Cost} = \text{Number of books} \times \text{Cost per book} + \text{£}2000$$

- (a) Find the Printing Cost when the Number of books is 300 and the Cost per book is £9.

$$\begin{aligned} P &= 300 \times 9 + 2000 \\ P &= 2700 + 2000 \\ P &= \text{£}4700 \end{aligned}$$

[2]

- (b) Find the Cost per book when the Printing Cost is £5000 and the Number of books is 600.

$$\begin{aligned} 5000 &= 600 \times C + 2000 \\ 5000 - 2000 &= 600C \\ 3000 &= 600C \\ C &= 3000 \div 600 = 5 \\ \text{So } \text{£}5 \text{ per book} \end{aligned}$$

[2]

7

The formula for the cost of hiring a hedge trimmer is

$$\text{Cost} = \text{Number of days} \times \text{£21} + \text{Hiring Fee}$$

- (a) Find the Cost when the Number of days is 4 and the Hiring Fee is £15.

$$C = 4 \times 21 + 15$$

$$C = 84 + 15$$

$$C = \text{£}99$$

[2]

- (b) Find the Hiring Fee, when the Cost is £230 and the Number of days is 10.

$$230 = 10 \times 21 + H$$

$$230 = 210 + H$$

$$230 - 210 = H$$

$$20 = H \quad \text{So hiring fee is £20}$$

[2]

(11)

The formula for the cost of buying a computer on credit is

$$\text{cost} = \text{monthly payment} \times 20 + \text{deposit}$$

- (a) Find the cost of a computer, when the monthly payment is £18 and the deposit is £50.

$$C = 18 \times 20 + 50$$

$$C = 360 + 50$$

$$C = \text{£}410$$

[2]

- (b) The cost of another computer is £520.
Find the monthly payment when the deposit is £60.

~~$$230 = M \times 20 + 60$$~~

~~$$230 - 60 = M \times 20$$~~

~~$$170 = M \times 20$$~~

~~$$170 \div 20 = M$$~~

$$\text{£}520 = M \times 20 + 60$$

$$520 - 60 = M \times 20$$

$$460 = M \times 20$$

$$460 \div 20 = M$$

$$23 = M$$

So £23 per month.