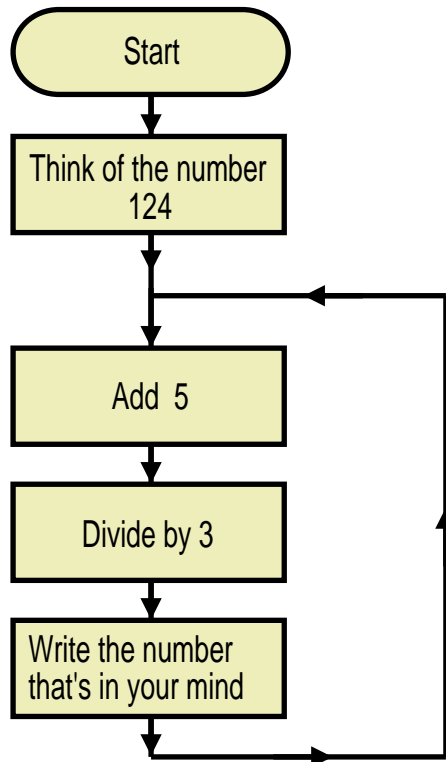**8.1 Homework (Revision)**

Non-Calculator

Marks Available : 60

Question 1

A number sequence, U, is described by the following flowchart,

Complete this table to show the first six terms in sequence U

U_1	U_2	U_3	U_4	U_5	U_6
124					

[7 marks]
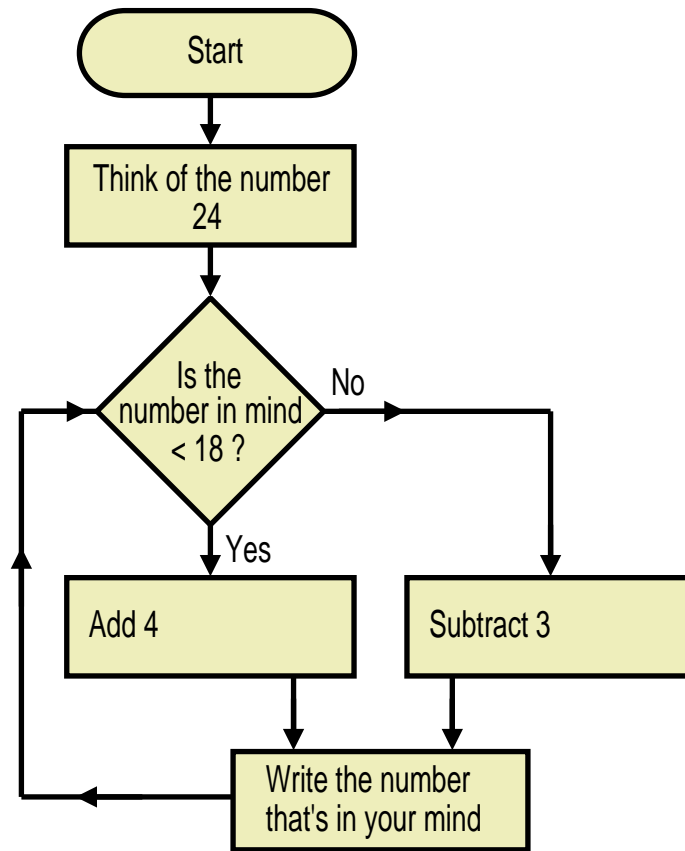
Question 2

Simplify,

(i) $4 \times \left(\dfrac{3}{4} + 1 \right)$ (ii) $\left(5 + \dfrac{3}{7} \right) \times 7$
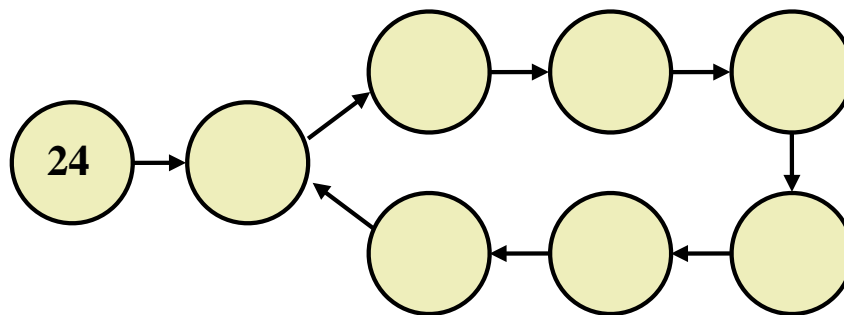
[4 marks]

Question 3

A number sequence, *K*, is described by the following flowchart,

The flowchart generates a loop of numbers.
On the following diagram write out the numbers that are in the loop.

[**8 marks**]

Question 4

First expand the brackets, then simplify,

(**i**) $\left(4 + \dfrac{1}{6} \right) \times 6$

[**2 marks**]

(**ii**) $\dfrac{\left(3 + \frac{2}{7} \right)}{4} \times \dfrac{7}{7}$

[**2 marks**]

Question 5

A sequence of numbers has the iterative rule

$$A_1 = \frac{1}{16} \qquad A_{n+1} = \frac{4}{3} A_n$$

Use the space below to work out the first six terms of this iterative sequence.
Simplify fractions where possible.
Put your answers in the table.

A_1	A_2	A_3	A_4	A_5	A_6

[7 marks]

Question 6

Simplify,

(i) $\quad \dfrac{\left(\frac{3}{8} + 2 \right)}{5} \times \dfrac{8}{8}$

[2 marks]

(ii) $\quad \dfrac{\left(5 + \frac{7}{4} \right)}{11}$

[2 marks]

(iii) $\quad \dfrac{\left(4 + \frac{2}{3} \right)}{5}$

[2 marks]

Question 7

(i) The following sum has an answer that is a rational number.

That is, a number in the form $\dfrac{p}{q}$ for integer p and q with $q \neq 0$

Determine what that rational number is.

$$\frac{\left(1 - \frac{1}{2}\right)}{3}$$

[2 marks]

(ii) Consider the iteration, $B_1 = \dfrac{1}{2}$, $B_{n+1} = \dfrac{1 - B_n}{3}$

Use the space below to work out the first six terms of this iterative sequence and put your answers in the table towards the bottom of the page.

B_1	B_2	B_3	B_4	B_5	B_6

[7 marks]

Question 8

Simplify,

(i) $\dfrac{1}{\left(\frac{5}{3} + 4\right)} \times \dfrac{3}{3}$

[2 marks]

(ii) $\dfrac{5}{\left(\frac{7}{8} + 2\right)}$

[2 marks]

(iii) $\dfrac{9}{\left(\frac{7}{5} - 1\right)}$

[2 marks]

Question 9

(i) The following sum has an answer that is a rational number.

That is, a number in the form $\dfrac{p}{q}$ for integer p and q with $q \neq 0$

Determine what that rational number is.

$$\frac{2}{\left(3 + \frac{2}{3}\right)}$$

[2 marks]

(ii) Consider the iteration, $Z_1 = 0$, $Z_{n+1} = \dfrac{2}{3 + Z_n}$

Use the space below to work out the first six terms of this iterative sequence and put your answers in the table towards the bottom of the page.

Z_1	Z_2	Z_3	Z_4	Z_5	Z_6

[7 marks]