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1. Here,
ID = 19202103303
∴ x = 3;

i) Code sequence 1 executes (2+3+2) = 7 instructions.

Code sequence 2 executes (4+2+1) = 7 instructions.

So, code sequence 1 and 2 executes same number of instructions.

ii) To find which one is faster, we need to find the CPU clock cycles needed for each sequence.

$$\therefore \text{CPU clock cycle} = \sum_{i=1}^{n} CPI_i \times IC_i$$

$$\text{CPU clock cycle}_1 = (2\times3) + (3\times2) + (2\times3)$$
$$= 18 \text{ cycles}$$

$$\text{CPU clock cycle}_2 = (4\times3) + (2\times2) + (1\times3)$$
$$= 19 \text{ cycles}$$

∴ sequence 1 excutes faster than the sequence 2.

iii)
$$CPI_1 = \frac{\text{CPU clock cycles}_1}{IC_1} = \frac{18}{7} = 2.57$$

$$CPI_2 = \frac{\text{CPU clock cycles}_2}{IC_2} = \frac{19}{7} = 1.29$$

2. Let's try $(13_{10})/(3_{10})$ or $(1101_2)/(0011)_2$

Iteration	Step	Quotient	Divisor	Remainder
0	Initial values	0000	0011 0000	0000 1101
1	1. Rem = Rem - Div	0000	0011 0000	1010 0011
	2. Rem < 0 ⇒ +Div, Sll Q, Q0 = 0	0000	0011 0000	0000 1101
	3. Shift Div right	0000	0001 1000	0000 1101
2		0000	0001 1000	~~0000~~ 1000 1011
		0000	0001 1000	0000 1101
		0000	0000 1100	0000 1101
		0000	0000 1100	0000 0001
3	Rem ≥ 0 ⇒ Sll. Q, Q0 = 1	0001	0000 1100	0000 0001
			0000 0110	0000 0001
		0001	0000 0110	1000 0101
4		0010	0000 0110	~~1000 0101~~ 0000 0001
		0010	0000 0011	0000 0001
		0010	0000 0011	1000 0010
5		0100	0000 0011	0000 0001
		0100	0000 0001	0000 0001