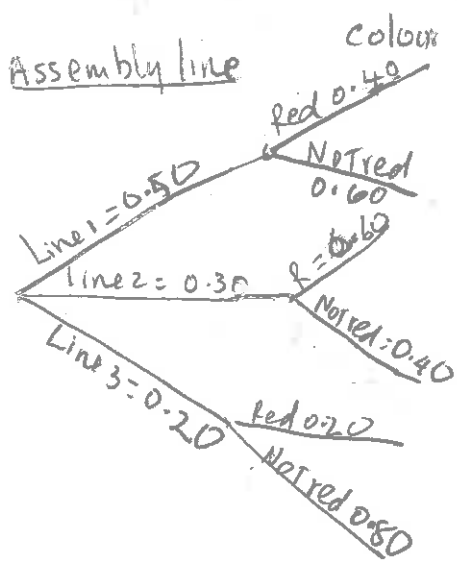


**Example 5**

An automobile factory has three assembly lines. Line 1 produces 50% of the cars, Line 2 produces 30% and Line 3 produces the rest. If a car is produced from line 1, then there is a 40% chance it is red. If it is produced from Line 2, then there is a 60% chance it is red. If it is produced from line 3, then there is a 20% chance it is red.

- a) What are the two events in this experiment? → Assembly line, colour of cars  
 b) Are these events independent or dependent? - Be cause the colour of car is dependent on the assembly line  
 c) If one car is selected at random from the factory, determine the probability it is red. (use tree diagram)



$$L_1R = 0.50 \times 0.40 = 0.20$$

$$L_1NR = 0.50 \times 0.60 = 0.30$$

$$L_2R = 0.30 \times 0.60 = 0.18$$

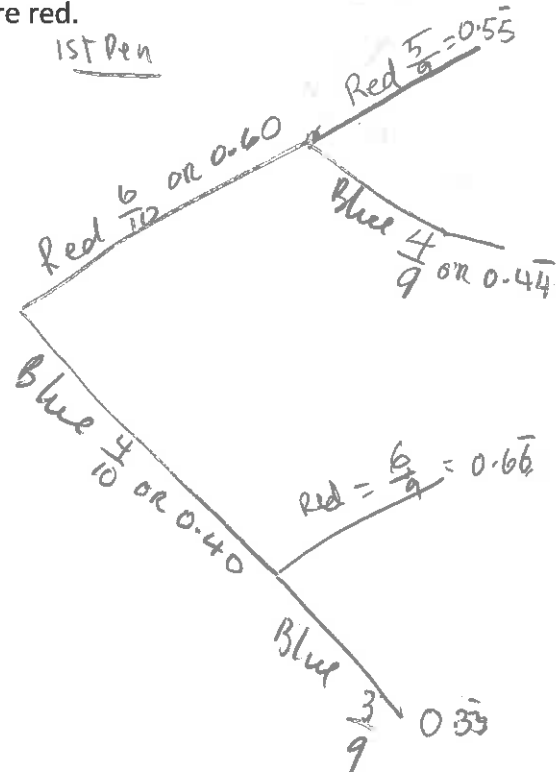
$$L_2NR = 0.30 \times 0.40 = 0.12$$

$$L_3R = 0.20 \times 0.20 = 0.04$$

$$L_3NR = 0.20 \times 0.80 = 0.16$$

**Example 6**

Shelly has 6 red pens and 4 blue pens in her pencil case. She removes a pen at random and gives it to a friend. She then takes out a pen at random for herself to use. Determine the probability that both pens selected are red.



$$P(\text{Red}) = 0.20 + 0.18 + 0.04 = 0.42$$

$$RR = \frac{6}{10} \times \frac{5}{9} = 0.33$$

$$RB = \frac{6}{10} \times \frac{4}{9} = 0.27$$

$$BR = \left(\frac{4}{10}\right) \times \left(\frac{6}{9}\right) = 0.27$$

$$BB = \left(\frac{4}{10}\right) \times \left(\frac{3}{9}\right) = 0.13$$

$P(RR) = 0.33$