

ASSIGNMENT: Probability Trees

A game is played, where a die is tossed and a marble selected from a bag.

Bag M contains 3 red marbles (R) and 2 green marbles (G).

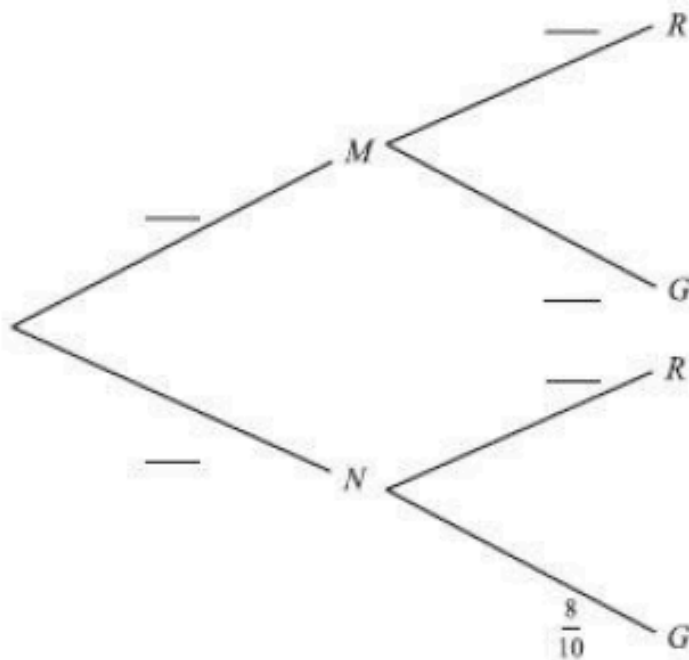
Bag N contains 2 red marbles and 8 green marbles.

A fair six-sided die is tossed. If a 3 or 5 appears on the die, bag M is selected (M).

If any other number appears, bag N is selected (N).

A single marble is then drawn at random from the selected bag.

(a) **Copy and complete the probability tree diagram on your answer sheet.**

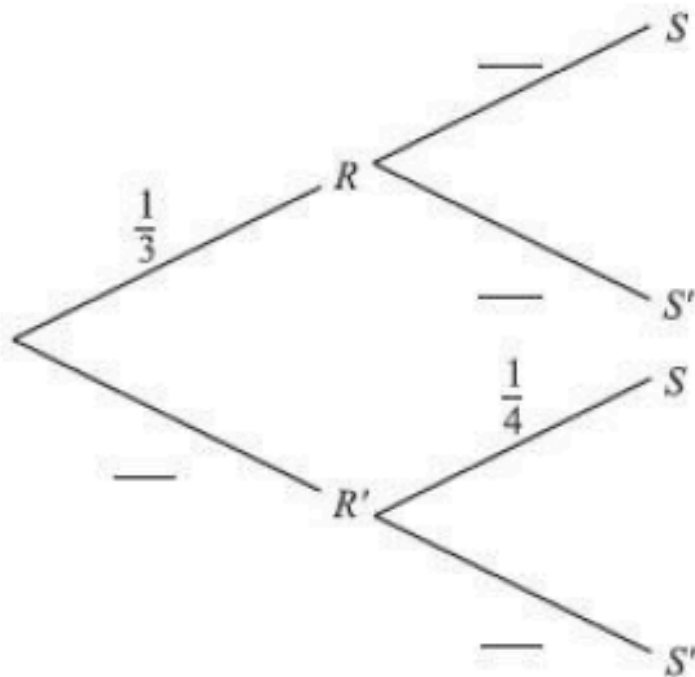


- (b) (i) Write down the probability that bag M is selected and a green marble drawn from it.
- (ii) Find the probability that a green marble is drawn from either bag.
- (iii) Given that the marble is green, calculate the probability that it came from Bag M.
- (c) A player wins \$2 for a red marble and \$5 for a green marble. What are his expected winnings?

The following probabilities were found for two events R and S .

$$P(R) = \frac{1}{3}, P(S | R) = \frac{4}{5}, P(S | R') = \frac{1}{4}.$$

(a) **Copy and complete** the tree diagram.



(b) Find the following probabilities.

(i) $P(R \cap S)$.

(ii) $P(S)$.

(iii) $P(R | S)$.