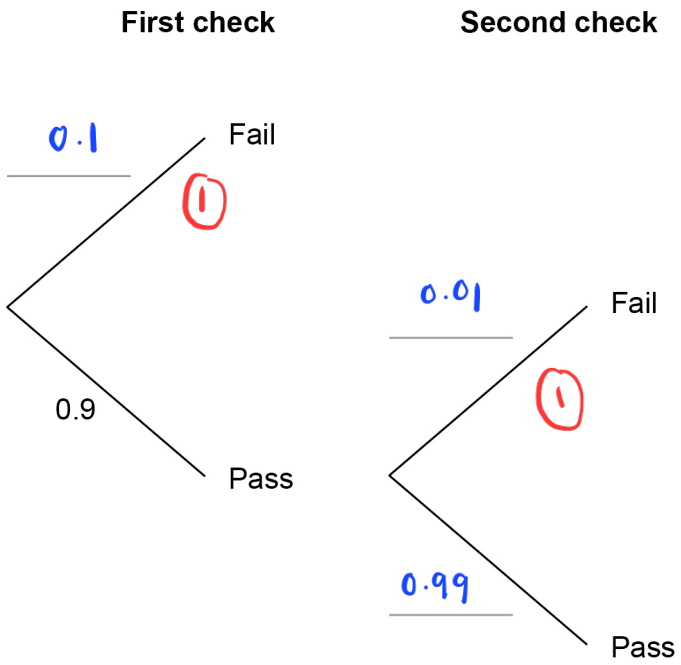
1 Items made at a factory have to pass two checks.

90% pass the first check.
The items that fail are scrapped.

99% of the items that pass the first check pass the second check.
The items that fail are scrapped.

1 (a) Complete the tree diagram.

[2 marks]



1 (b) An item is chosen at random before the checks.

Work out the probability that the item is scrapped.

[3 marks]

$0.1 + (0.9 \times 0.01)$ (1)

$0.1 + 0.009 = 0.109$ (1)

(1)

Answer 0.109

2 In a game, two bags, A and B, contain cards.

Each card is marked Yes or No.

The table shows the number of each type of card in the bags.

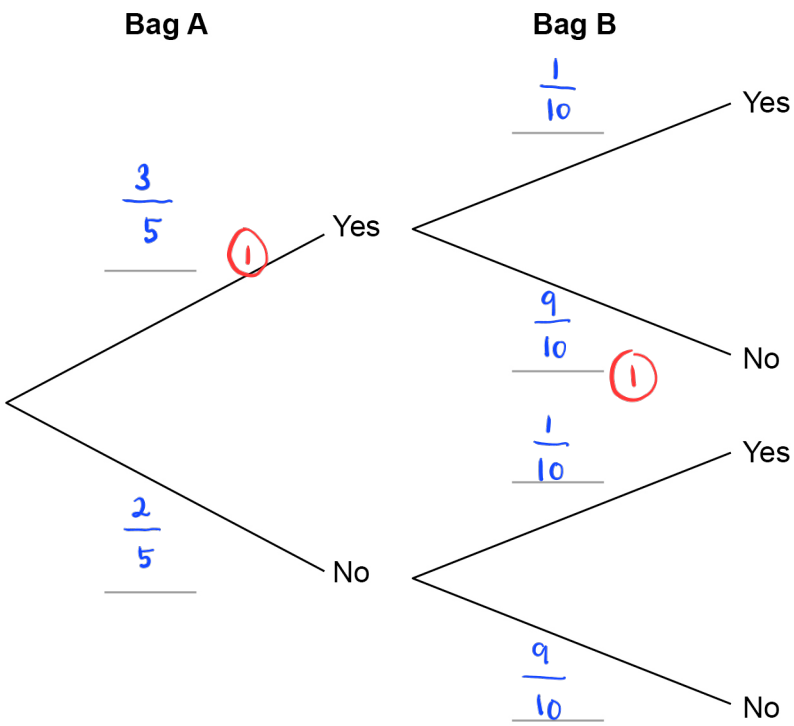
	Yes	**No**
Bag A	3	2
Bag B	1	9

In the game, a player picks one card at random from each bag.

The cards are then put back into the bags.

2 (a) Complete the tree diagram.

[2 marks]



2 (b) To win a prize, a player must pick two cards marked Yes.

450 people each play the game once.

How many people are expected to win a prize?

[3 marks]

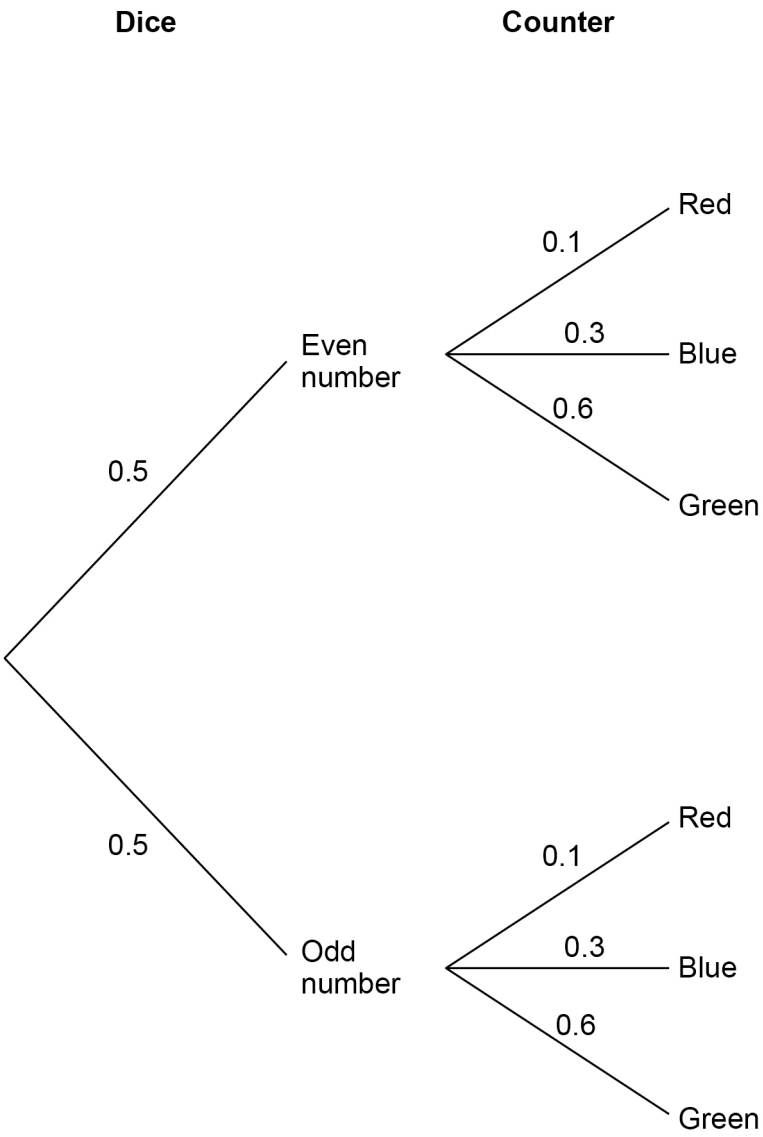
$\frac{3}{5} \times \frac{1}{10} = \frac{3}{50}$ (1)

$\frac{3}{50} \times 450 = 27$ (1) (1)

Answer 27

3 A fair, ordinary dice is rolled and a counter is taken at random from a bag.

The tree diagram shows the probabilities.



3 (a) How do the probabilities show that **all** the counters in the bag are red, blue or green?

[1 mark]

$0.1 + 0.3 + 0.6 = 1$ (1)

3 (b) Circle the probability that the counter is red **or** blue.

$0.1 + 0.3 = 0.4$

[1 mark]

0.0009 0.8 0.03 0.4 (1)

3 (c) Circle the probability that the dice lands on an even number **and** the counter is blue.

$0.5 \times 0.3 = 0.15$

[1 mark]

0.15 (1) 0.3 0.35 0.8

4 Cards are either gold or not gold.

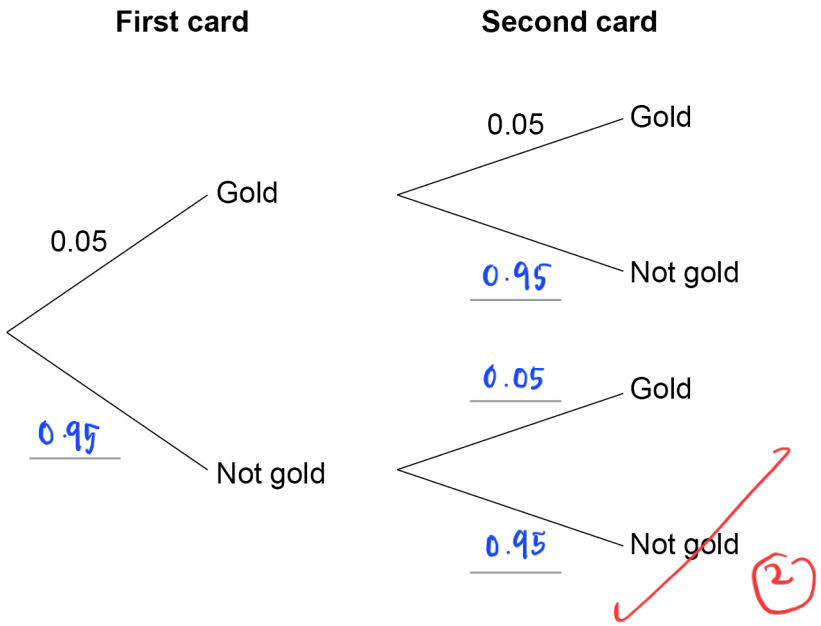
P(gold) = 0.05

Harim chooses a card at random and replaces it.

He then chooses a second card.

4 (a) Complete the tree diagram.

[2 marks]



4 (b) What is the probability that **at least one** of Harim's cards is gold?

[3 marks]

one is gold = (G, NG) or (NG, G)

= 0.05 × 0.95 + 0.95 × 0.05

= 0.095 (1)

both are gold = 0.05 × 0.05 = 0.0025 (1)

∴ 0.095 + 0.0025 = 0.0975

Answer 0.0975 (1)