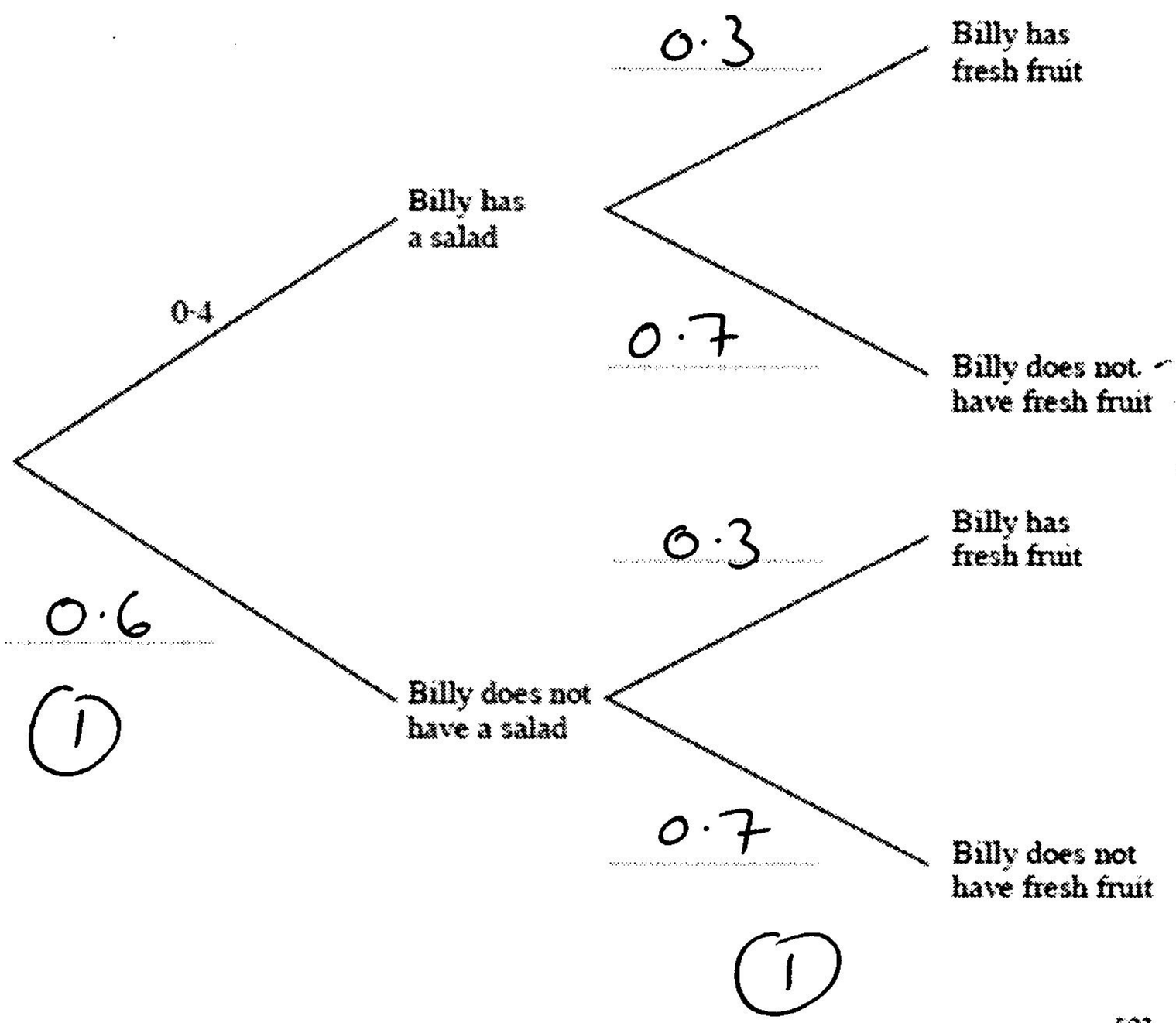
ANSWERS

Tree Diagrams – Past Paper Questions

8. At lunchtime, the probability that Billy has a salad is 0·4. Whether or not Billy has a salad, the probability that Billy has fresh fruit afterwards is 0·3.

(a) Complete the following tree diagram.



[2]

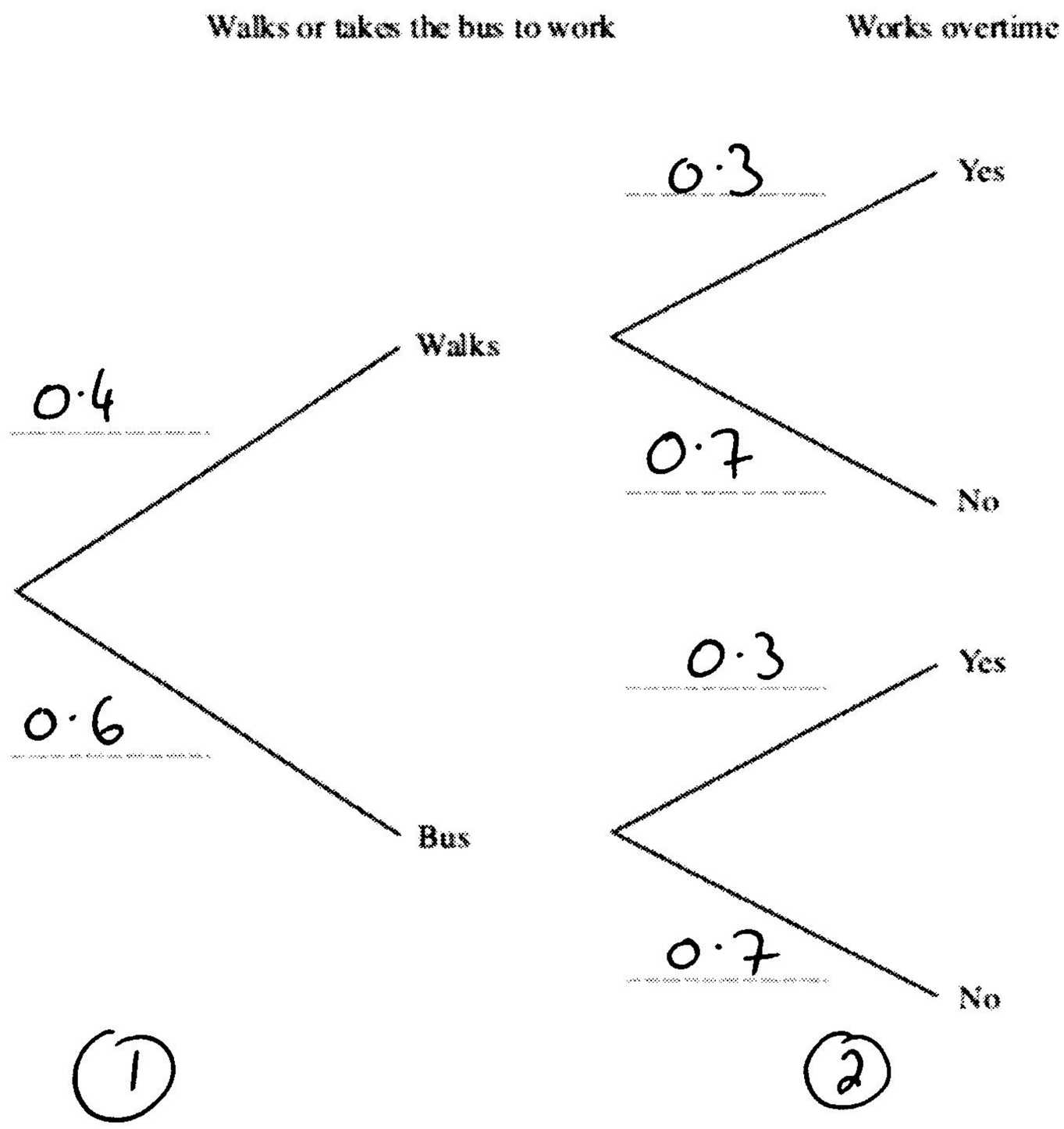
(b) Calculate the probability that Billy has a salad for lunch but does not have fresh fruit afterwards.

$0.4 \times 0.7 = 0.28$

[2]

13. Carly can either walk or take the bus to work.
The probability that she walks to work is 0·4.
The probability that she works overtime is 0·3.
These events are independent.

(a) Complete the following tree diagram.



[3]

(b) Calculate the probability that Carly walks to work and works overtime.

0·4 x 0·3 = 0·12

1

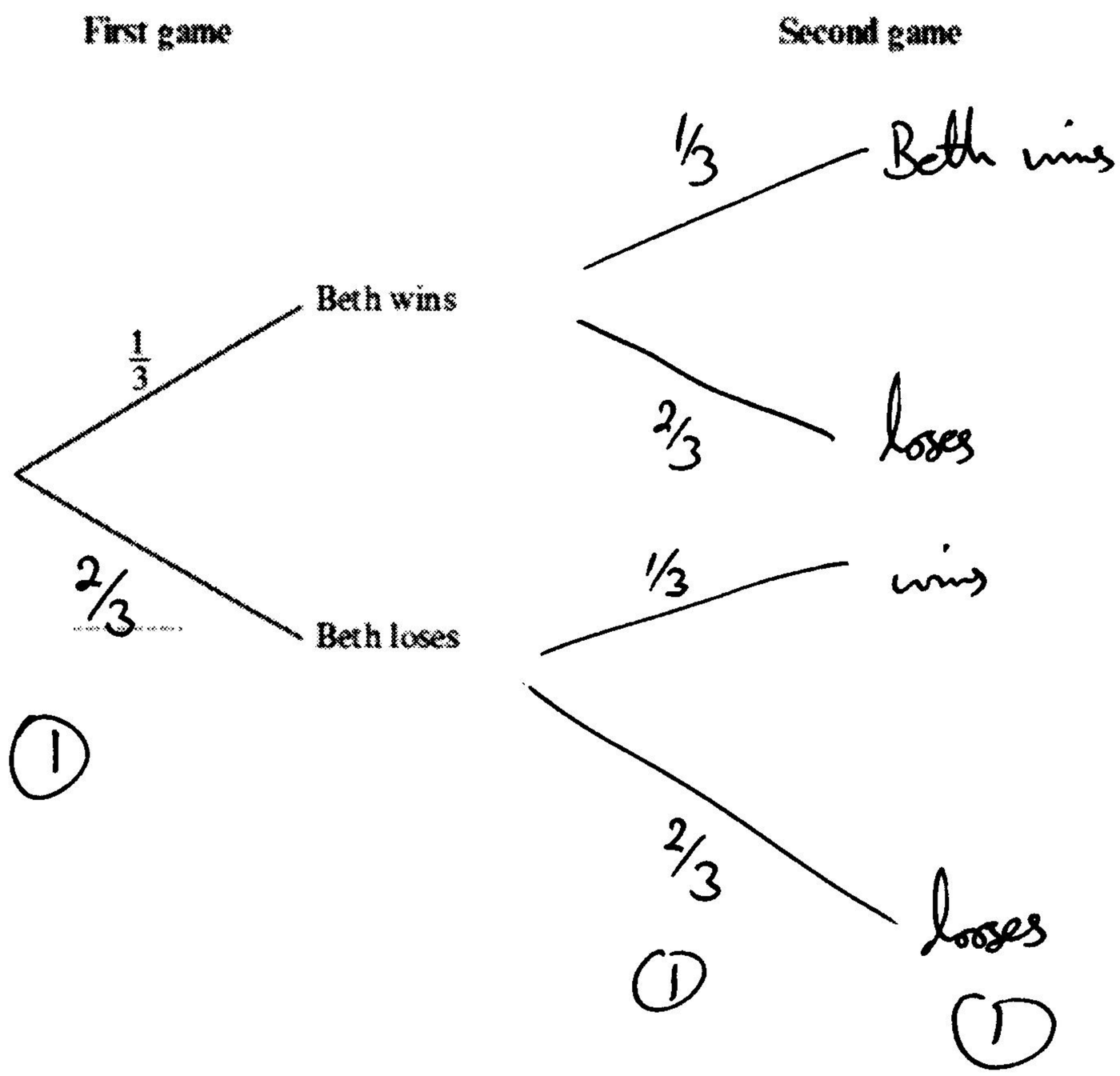
1

[2]

10. Whenever Beth plays a game of pool against Zainab, the probability that she wins the game is $\frac{1}{3}$.

Beth plays **two** games of pool against Zainab.

(a) Complete the following tree diagram to show the probabilities of what can happen when Beth plays **two** games of pool against Zainab.



[3]

(b) Calculate the probability that Beth wins both games against Zainab.

$\frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$

1 1

[2]

20. A bag contains 20 beads. There are 3 green, 4 yellow and 13 red beads in the bag.
Two beads are selected at random without replacement from the bag.

(a) Calculate the probability that both selected beads are yellow.

$\frac{4}{20} \times \frac{3}{19} = \frac{12}{380} = \frac{6}{190} = \frac{3}{95}$

1 1

[2]

(b) Calculate the probability that the two beads are different colours.

YR $= \frac{4}{20} \times \frac{13}{19} = \frac{52}{380}$

YG $= \frac{4}{20} \times \frac{3}{19} = \frac{12}{380}$

RY $= \frac{13}{20} \times \frac{4}{19} = \frac{52}{380}$ 3

RG $= \frac{13}{20} \times \frac{3}{19} = \frac{39}{380}$

GY $= \frac{3}{20} \times \frac{4}{19} = \frac{12}{380}$

GR $= \frac{3}{20} \times \frac{13}{19} = \frac{39}{380}$

$\frac{206}{380} = \frac{103}{190}$ 1

[4]

14. A bag contains 11 marbles.
There are 3 yellow, 3 blue and 5 red marbles in the bag.
Two marbles are selected at random from the bag.

(a) Calculate the probability that both the selected marbles are blue.

$\frac{3}{11} \times \frac{2}{10} = \frac{6}{110} = \frac{3}{55}$

1 1

[2]

(b) Calculate the probability that exactly one of the selected marbles is red.

1 RY $= \frac{5}{11} \times \frac{3}{10} = \frac{15}{110}$

RB $= \frac{5}{11} \times \frac{3}{10} = \frac{15}{110}$ 1

BR $= \frac{3}{11} \times \frac{5}{10} = \frac{15}{110}$

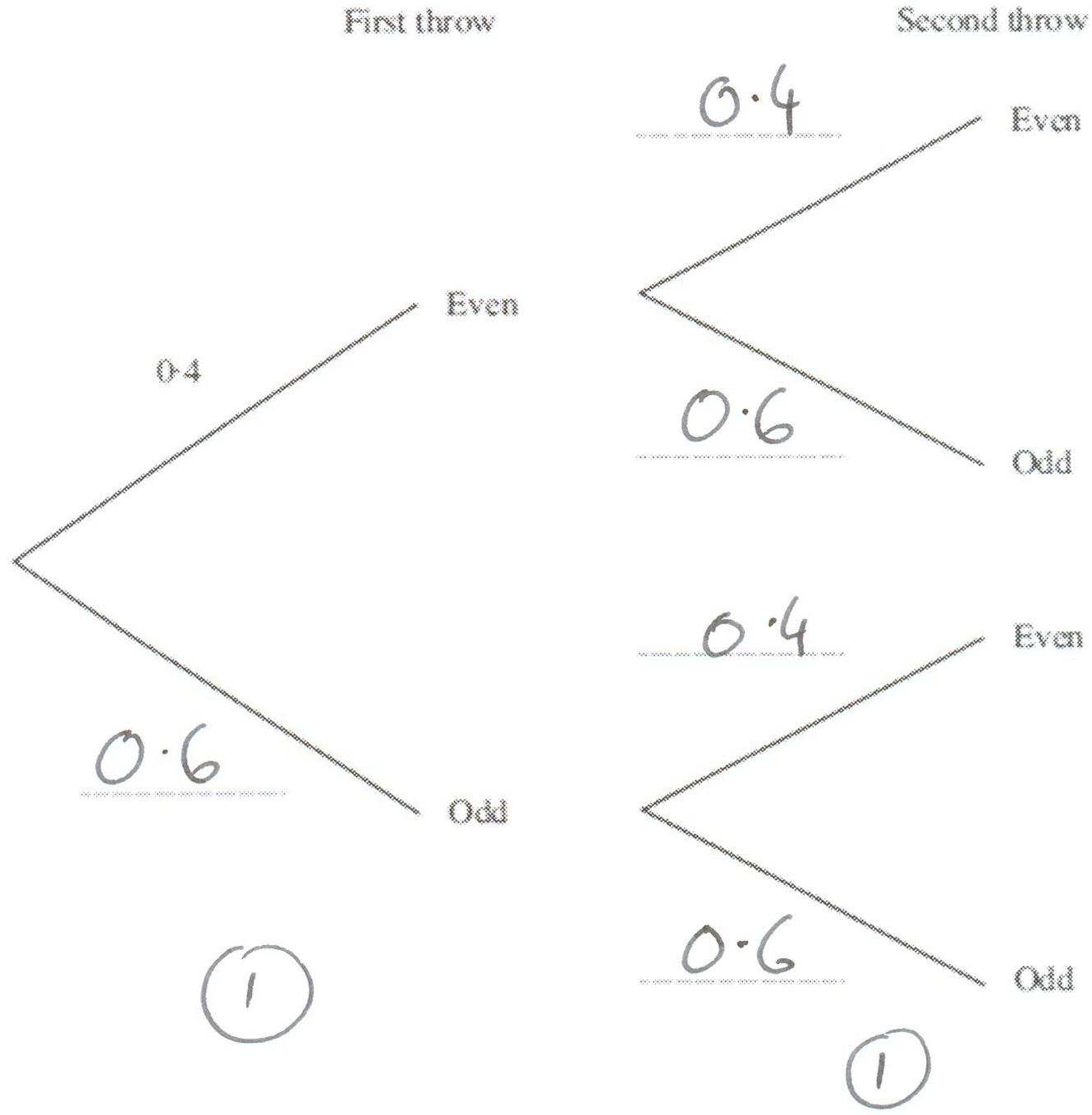
YR $= \frac{3}{11} \times \frac{5}{10} = \frac{15}{110}$

$\frac{60}{110} = \frac{6}{11}$ 1

[3]

10. Each time Robert throws a biased dice, the probability that he throws an even number is 0·4. Robert throws this biased dice twice.

(a) Complete the following probability tree diagram.



[2]

(b) Robert's score is the sum of the two numbers thrown.
Calculate the probability that Robert's score is even.

E+E = 0·4 x 0·4 = 0·16 (1)

O+O = 0·6 x 0·6 = 0·36 (1)

0·52 (1)

[3]