5.7 Tree Diagrams for Independent Events: 1-hour Pack

Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 The probability that it rains on each of two days is 0.3, independently of the other day.
Work out the probability that it rains on both days.

(2)

2 The probability that it rains on each of two days is 0.7, independently of the other day.
Work out the probability that it rains on at least one of the days.

(3)

3 A bag contains 1 purple counters and 2 orange counters. A counter is taken at random, its colour is noted and it is put back. A second counter is then taken at random.
Work out the probability that both counters are purple.

(3)

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4 The probability that it rains on each of two days is 0.3, independently of the other day. Work out the probability that it rains on exactly one of the days.

(3)

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5 A bag contains 1 purple counters and 5 green counters. A counter is taken at random, its colour is noted and it is put back. A second counter is then taken at random. Work out the probability that both counters are purple.

(3)

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6 A bag contains 6 yellow counters and 3 white counters. A counter is taken at random, its colour is noted and it is put back. A second counter is then taken at random. Work out the probability that both counters are white.

(3)

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7 The probability that Grace wins a game of chess is 0.7. Grace plays two games. The results are independent. Work out the probability that Grace wins both games.

(2)

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8 A bag contains 1 green counters and 3 yellow counters. A counter is taken at random, its colour is noted and it is put back. A second counter is then taken at random.
Work out the probability that at least one of the counters is green.

(4)

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9 The probability that Priya wins a game of chess is 0.3. Priya plays two games. The results are independent. Work out the probability that Priya wins both games.

(2)

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10 The probability that Leo wins a game of chess is 0.4. Leo plays two games. The results are independent. Work out the probability that Leo wins both games.

(2)

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11 A bag contains 2 black counters and 7 red counters. A counter is taken at random, its colour is noted and it is put back. A second counter is then taken at random.
Work out the probability that at least one of the counters is black.

(4)

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12 The probability that the bus is late on each of two mornings is 0.3, independently of the other day.
Work out the probability that the bus is late on both days.

(2)

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13 The probability that the bus is late on each of two mornings is 0.6, independently of the other day.
Work out the probability that the bus is late on at least one of the days.

(3)

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14 A bag contains 5 green counters and 5 orange counters. A counter is taken at random, its colour is noted and it is put back. A second counter is then taken at random.
Work out the probability that both counters are orange.

(3)

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15 A bag contains 3 red counters and 6 purple counters. A counter is taken at random, its colour is noted and it is put back. A second counter is then taken at random.
Work out the probability that at least one of the counters is red.

(4)

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16 A bag contains 5 orange counters and 4 green counters. A counter is taken at random, its colour is noted and it is put back. A second counter is then taken at random.
Work out the probability that both counters are orange.

(3)

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17 A gardener has a 60% chance of watering her plants in the morning and a 30% chance of watering them in the evening. The two actions are independent. Find the probability she waters them both morning and evening on a given day.

(2)

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Mark scheme · 5.7 Tree Diagrams for Independent Events: 1-hour Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

0.3 x 0.3	M1
0.09 cao	A1

Answer: **0.09**

Question 2

0.3 x 0.3	M1
1 - P(neither)	M1
0.91 cao	A1

Answer: **0.91**

Question 3

P(purple) = 1/3	M1
1/3 x 1/3	M1
1/9 cao	A1

Answer: **1/9**

Question 4

0.3 x 0.7 seen	M1
two routes added	M1
0.42 cao	A1

Answer: **0.42**

Question 5

P(purple) = 1/6	M1
1/6 x 1/6	M1
1/36 cao	A1

Answer: **1/36**

Question 6

P(white) = 1/3	M1
1/3 x 1/3	M1
1/9 cao	A1

Answer: **1/9**

Question 7

0.7 x 0.7	M1
0.49 cao	A1

Answer: **0.49**

Question 8

P(both yellow) = 3/4 x 3/4	M1
9/16 found	M1
1 - P(both not green)	M1
7/16 cao	A1

Answer: **7/16**

Question 9

0.3 x 0.3	M1
0.09 cao	A1

Answer: **0.09**

Question 10

0.4 x 0.4	M1
0.16 cao	A1

Answer: **0.16**

Question 11

P(both red) = 7/9 x 7/9	M1
49/81 found	M1
1 - P(both not black)	M1
32/81 cao	A1

Answer: **32/81**

Question 12

0.3 x 0.3	M1
0.09 cao	A1

Answer: **0.09**

Question 13

0.4 x 0.4	M1
1 - P(neither)	M1
0.84 cao	A1

Answer: **0.84**

Question 14

P(orange) = 1/2	M1
1/2 x 1/2	M1
1/4 cao	A1

Answer: **1/4**

Question 15

P(both purple) = 2/3 x 2/3	M1
4/9 found	M1
1 - P(both not red)	M1
5/9 cao	A1

Answer: **5/9**

Question 16

P(orange) = 5/9	M1
5/9 x 5/9	M1
25/81 cao	A1

Answer: **25/81**

Question 17

method: multiply 0.6 x 0.3 or 60% x 30%	M1
0.18 or 18% cao	A1

Answer: **0.18**

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