S20-30min Mutually Exclusive Events: 30-minute Pack

EDEXCEL 1ST0 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A game show spinner has three mutually exclusive and exhaustive outcomes: Win, Draw and Lose. P(Win) = 0.2 and P(Lose) = 0.55. Work out P(Draw).

(Total for Question 1 is 2 marks)

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2 Events X and Y are mutually exclusive. P(X) = 0.4 and P(Y) = 0.35. Write down the value of P(X or Y).

(Total for Question 2 is 1 mark)

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3 A spinner has sections A, B and C only. P(A) = 0.3 and P(B) = 0.45. Work out P(C).

(Total for Question 3 is 2 marks)

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4 Events P and Q are mutually exclusive. P(P) = 0.18 and P(Q) = 0.37. Work out P(P or Q).

(Total for Question 4 is 2 marks)

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5 Priya rolls a biased six-sided dice a large number of times to estimate the probability of each score. Her estimated probabilities are shown in the table.

Score	1	2	3	4	5	6
Probability	0.1	0.2	0.15	0.25	0.2	0.15

(a) Work out the sum of the six probabilities in the table. **(1)**

.....

(b) Explain why the table must contain a mistake. **(1)**

(c) The probability for score 4 was recorded incorrectly. Given that all the other five probabilities are correct, work out the correct probability for score 4. **(2)**

.....

(Total for Question 5 is 4 marks)

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6 A fair coin is flipped once and, at the same time, a fair four-sided spinner labelled 1 to 4 is spun once. The two-way table shows all 8 equally likely outcomes.

Coin/Spinner	1	2	3	4
Heads	H1	H2	H3	H4
Tails	T1	T2	T3	T4

(a) Write down the probability of getting Heads and a 3 (outcome H3). **(1)**

.....

(b) Work out the probability of getting (Heads and an even number) or (Tails and a 1). These outcomes are H2, H4 and T1. **(2)**

.....

(Total for Question 6 is 3 marks)

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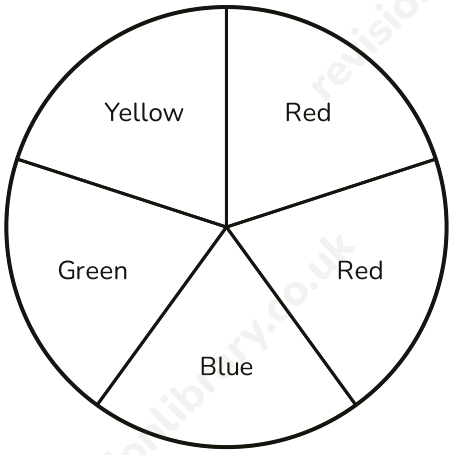
7 The spinner shown is divided into 5 equal sections. It is spun once.



(a) Write down P(Red). **(1)**

.....

(b) Work out P(Red or Blue). **(2)**

.....

(c) Work out P(not Green). **(1)**

.....

(Total for Question 7 is 4 marks)

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8 In a class of 32 students, every student studies exactly one of French, Spanish or German. 14 study French and 9 study Spanish. Work out the probability that a student picked at random studies German.

(Total for Question 8 is 2 marks)

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9 A bag contains only black and white counters, 40 counters in total. The probability of picking a black counter at random is 0.6. Work out the number of white counters in the bag.

(Total for Question 9 is 2 marks)

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10 A biased four-sided spinner has sections labelled 1, 2, 3 and 4. P(1) = 0.15, P(2) = 0.2 and P(3) = 0.4. Work out P(4).

(Total for Question 10 is 2 marks)

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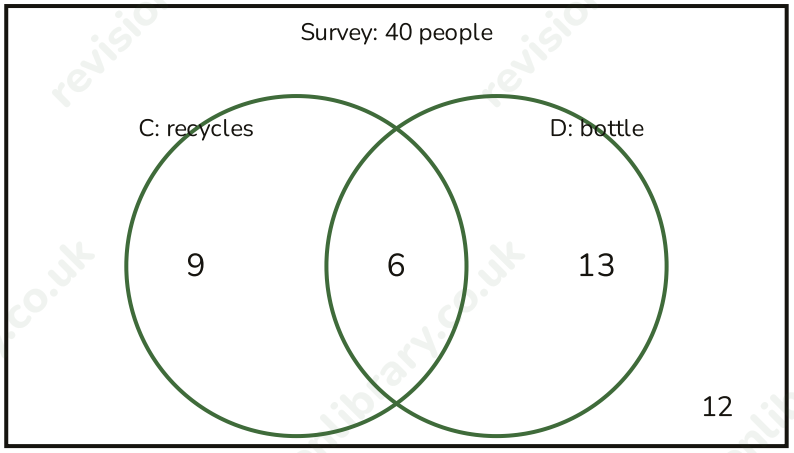
11 In the same survey of 40 people, event C is 'recycles regularly' and event D is 'owns a reusable water bottle'. The Venn diagram shows the number of people in each region.



(a) Explain why events C and D are not mutually exclusive. **(1)**

(b) Write down the number of people who recycle regularly. **(1)**

.....

(c) Work out the probability that a randomly chosen person owns a reusable water bottle but does not recycle regularly. **(2)**

.....

(d) Write down the number of people who recycle regularly or own a reusable water bottle (or both). **(1)**

.....

(Total for Question 11 is 5 marks)

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Mark scheme · S20-30min Mutually Exclusive Events: 30-minute Pack

Question 1

- **M1** 1 - 0.2 - 0.55, oe
- **A1** 0.25 cao
- **Answer: 0.25**

Question 2

- **B1** 0.75 cao
- **Answer: 0.75**

Question 3

- **M1** 1 - 0.3 - 0.45, oe
- **A1** 0.25 cao
- **Answer: 0.25**

Question 4

- **M1** 0.18 + 0.37, oe
- **A1** 0.55 cao
- **Answer: 0.55**

Question 5

- (a) **B1** 1.05 cao
- **(a) Answer: 1.05**
- (b) **B1** the probabilities of all the outcomes should sum to 1, but they sum to 1.05 (oe)
- **(b) Answer: The probabilities should add up to 1, but they add up to 1.05, which is too high.**
- (c) **M1** 0.1+0.2+0.15+0.2+0.15 (= 0.8), oe
- (c) **A1** 0.2 cao
- **(c) Answer: 0.2**

Question 6

- (a) **B1** 1/8 oe (0.125)
- **(a) Answer: 1/8**
- (b) **M1** identifying the 3 outcomes H2, H4, T1 from the 8 in the table, oe
- (b) **A1** 3/8 cao
- **(b) Answer: 3/8**

Question 7

- (a) **B1** 2/5 oe (0.4)
- **(a) Answer: 2/5**
- (b) **M1** 2/5 + 1/5, oe
- (b) **A1** 3/5 cao
- **(b) Answer: 3/5**
- (c) **B1** 4/5 oe (1 - 1/5)
- **(c) Answer: 4/5**

Question 8

- **M1** 32 - 14 - 9, oe
- **A1** 9/32 oe cao
- **Answer: 9/32**

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Question 9

- **M1** (1 - 0.6) x 40, oe
- **A1** 16 cao
- **Answer: 16**

Question 10

- **M1** 1 - 0.15 - 0.2 - 0.4, oe
- **A1** 0.25 cao
- **Answer: 0.25**

Question 11

- (a) **B1** it is possible to belong to both C and D at the same time - 6 people do both (oe)
- **(a) Answer: C and D are not mutually exclusive because 6 people both recycle and own a reusable bottle.**
- (b) **B1** 15 cao
- **(b) Answer: 15**
- (c) **M1** identifying the 'only D' region = 13, oe
- (c) **A1** 13/40 oe cao
- **(c) Answer: 13/40**
- (d) **B1** 28 cao
- **(d) Answer: 28**

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