EP.M129 Probability Scale and Simple Outcomes

GL ASSESSMENT GL-11PLUS-MATHS · Calculators not allowed · about 55 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Which point on a probability scale from 0 to 1 shows an event that is certain to happen?

- ☐ A) 0
- ☐ B) 0.25
- ☐ C) 0.5
- ☐ D) 0.75
- ☐ E) 1

(Total for Question 1 is 1 mark)

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2 A fair coin is flipped once. What is the probability of getting heads?

- ☐ A) 0
- ☐ B) 1/4
- ☐ C) 1/2
- ☐ D) 3/4
- ☐ E) 1

(Total for Question 2 is 1 mark)

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3 Which of the following numbers could not be a probability for a single event?

- ☐ A) 0.1
- ☐ B) -0.2
- ☐ C) 0.5
- ☐ D) 0.9
- ☐ E) 0.0

(Total for Question 3 is 1 mark)

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4 A bag contains 5 red, 3 blue and 2 green counters. One counter is chosen at random. List all the possible colours you could draw.

(Total for Question 4 is 1 mark)

5 A bag contains 2 red counters and 3 blue counters. One counter is drawn at random. Calculate the probability that it is red.

(Total for Question 5 is 2 marks)

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6 Which point on a probability scale from 0 to 1 represents an impossible event?

- ☐ A) 0
- ☐ B) 0.2
- ☐ C) 0.5
- ☐ D) 0.8
- ☐ E) 1

(Total for Question 6 is 1 mark)

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7 A spinner is divided into 8 equal sectors. Three sectors have a star on them. What is the probability of landing on a star?

(Total for Question 7 is 2 marks)

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8 Two fair coins are tossed once.

(a) List the sample space for the two coin tosses. Give the outcomes using H and T. **(1)**

(b) Calculate the probability that both coins show heads. **(1)**

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(Total for Question 8 is 2 marks)

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9 Which decimal is the same as the probability 1/4?

- ☐ A) 0.2
- ☐ B) 0.25
- ☐ C) 0.4
- ☐ D) 0.5
- ☐ E) 0.75

(Total for Question 9 is 1 mark)

10 A bag contains 4 red, 1 blue and 5 green counters. One counter is drawn at random. Calculate the probability that the counter is not green. Give your answer in simplest form.

(Total for Question 10 is 3 marks)

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11 Which fraction is equivalent to the probability 0.5?

- ☐ A) 1/4
- ☐ B) 1/3
- ☐ C) 1/2
- ☐ D) 2/3
- ☐ E) 3/4

(Total for Question 11 is 1 mark)

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12 Tom rolls a fair spinner numbered 1 to 10. What is the probability that the spinner shows a number less than or equal to 3?

(Total for Question 12 is 1 mark)

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13 A coin is tossed and a 4-sided spinner labelled A, B, C and D is spun once.

(a) List the sample space for the combined experiment using H or T for the coin and the spinner letter. **(1)**

(b) Calculate the probability of getting Heads and spinner B. **(1)**

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(Total for Question 13 is 2 marks)

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14 A bag contains 7 white marbles and 3 black marbles. One marble is drawn at random. Calculate the probability that it is not white. Give your answer in simplest form.

(Total for Question 14 is 2 marks)

15 Which of these shows a probability greater than 1 that cannot be correct for a single event?

- ☐ A) 1/2
- ☐ B) 3/4
- ☐ C) 5/4
- ☐ D) 0
- ☐ E) 1

(Total for Question 15 is 1 mark)

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16 Two fair six-sided dice are rolled. What is the probability that both dice show even numbers?

(Total for Question 16 is 2 marks)

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17 Two fair coins are tossed once. Calculate the probability of getting exactly one head.

(Total for Question 17 is 2 marks)

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18 Which decimal is equal to the probability 1/5?

- ☐ A) 0.2
- ☐ B) 0.25
- ☐ C) 0.4
- ☐ D) 0.05
- ☐ E) 2.0

(Total for Question 18 is 1 mark)

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19 Three fair coins are tossed once. Calculate the probability of getting at least one head.

(Total for Question 19 is 3 marks)

20 A bag contains 3 red, 2 blue and 5 yellow counters. Two counters are drawn with replacement (the first counter is put back before drawing again). Calculate the probability that both counters drawn are blue. Give your answer in simplest form.

(Total for Question 20 is 3 marks)

Mark scheme · EP.M129 Probability Scale and Simple Outcomes

Question 1

- **B1** correct option E (1) cao
- **Answer: E) 1 (certain event).**

Question 2

- **B1** correct option C (1/2) cao
- **Answer: C) 1/2**

Question 3

- **B1** correct option B (-0.2) cao
- **Answer: B) -0.2**

Question 4

- **B1** correct sample space {red, blue, green} cao
- **Answer: red, blue, green**

Question 5

- **M1** method: 2 red counters seen as numerator or 2/(2+3) seen
- **A1** 2/5 cao
- **Answer: 2/5 (two fifths).**

Question 6

- **B1** correct option A (0) cao
- **Answer: A) 0**

Question 7

- **M1** method: 3 favourable sectors seen over 8 total, 3/8
- **A1** 3/8 cao
- **Answer: 3/8**

Question 8

- (a) **B1** correct sample space {HH, HT, TH, TT} cao
- **(a) Answer: HH, HT, TH, TT**
- (b) **B1** 1/4 cao
- **(b) Answer: 1/4**

Question 9

- **B1** correct option B (0.25) cao
- **Answer: B) 0.25**

Question 10

- **M1** method: count not green as 4 + 1 = 5
- **M1** method: total counters seen as 10 (4 + 1 + 5)
- **A1** 5/10 simplified to 1/2 cao
- **Answer: 1/2 (one half).**

Question 11

- **B1** correct option C (1/2) cao
- **Answer: C) 1/2**

Question 12

- **B1** 3/10 cao
- **Answer: 3/10**

Question 13

- (a) **B1** correct sample space {H A, H B, H C, H D, T A, T B, T C, T D} cao
- **(a) Answer: HA, HB, HC, HD, TA, TB, TC, TD**
- (b) **B1** 1/8 cao
- **(b) Answer: 1/8**

Question 14

- **M1** method: count not white as 3 seen
- **A1** 3/10 cao
- **Answer: 3/10**

Question 15

- **B1** correct option C (5/4) cao
- **Answer: C) 5/4**

Question 16

- **M1** method: probability one die even = 3/6 = 1/2
- **A1** both even = 1/2 x 1/2 = 1/4 cao
- **Answer: 1/4**

Question 17

- **M1** method: exactly one head occurs in HT and TH, 2 favourable outcomes seen
- **A1** 2/4 = 1/2 cao
- **Answer: 1/2**

Question 18

- **B1** correct option A (0.2) cao
- **Answer: A) 0.2**

Question 19

- **M1** method: probability of no heads (TTT) = 1/8 identified
- **M1** method: use complement 1 - 1/8 seen
- **A1** 7/8 cao
- **Answer: 7/8**

Question 20

- **M1** method: probability of blue on one draw = 2/10 (2 blue out of 10 total)
- **M1** method: with replacement multiply probabilities: (2/10) x (2/10) = 4/100
- **A1** 4/100 simplified to 1/25 cao
- **Answer: 1/25 (one twenty fifth).**