nexamind EDUCATION

Name _____ Date _____

Stage 7 End-of-unit test 13 — mark scheme

21 questions · 41 marks · calculators are not allowed · allow about 45 minutes

1 How likely is it that you will roll a 7 on an ordinary dice? **[1]**

- ☐ impossible
- ☐ unlikely
- ☐ even chance
- ☐ certain

Answer: impossible

A dice has no 7.

2 What is the largest a probability can be? **[1]**

- ☐ 1
- ☐ 10
- ☐ 100
- ☐ There is no largest

Answer: 1

1 means certain.

3 A probability is 3/8. What is that as a percentage? **[2]**

Answer: 37.5

3 ÷ 8 = 0.375 = 37.5%.

4 An event has probability 0.3. What is the probability it does not happen? **[2]**

Answer: 0.7

1 − 0.3 = 0.7.

5 A fair dice is rolled. What is the probability of an even number? **[2]**

Answer: 1/2

3 of the 6 outcomes are even: 3/6 = 1/2.

6 A bag holds 12 counters, 5 of them blue. What is the probability of blue? **[2]**

Answer: 5/12

5 favourable out of 12.

7 A bag holds 12 counters, 5 of them blue. What is the probability of not blue? **[2]**

Answer: 7/12

1 − 5/12 = 7/12.

8 How do you calculate a probability with equally likely outcomes? [1]

- ☐ Guess
- ☐ Favourable ÷ total
- ☐ Total ÷ favourable
- ☐ Add them

Answer: Favourable ÷ total
The count you want over everything possible.

9 The probabilities of all possible outcomes add to … [1]

- ☐ 0
- ☐ 1/2
- ☐ 1
- ☐ 100

Answer: 1
Something must happen.

10 A bag holds 4 red, 5 blue and 3 green counters. What is the probability of red or green? [3]

Answer: 7/12
4 + 3 = 7 out of 12; the events are mutually exclusive so the probabilities add.

11 A bag has 20 counters and P(red) = 1/4. How many are red? [2]

Answer: 5
1/4 of 20 = 5.

12 Two events are mutually exclusive when … [2]

- ☐ they are equally likely
- ☐ they cannot both happen
- ☐ they always happen
- ☐ they have equal probability

Answer: they cannot both happen
So no outcome is counted twice.

13 A fair spinner has 6 equal sectors. It is spun 60 times. How many times would you expect each number? [2]

Answer: 10
1/6 × 60 = 10.

14 A dice is rolled 300 times. How many sixes would you expect? [2]

Answer: 50
1/6 × 300 = 50.

15 In 60 trials an event happened 12 times. What is the experimental probability? [2]

Answer: 1/5
12/60 = 1/5.

16 A fair coin gives 7 heads in 10 tosses. Is it unfair? [3]

- ☐ Yes definitely
- ☐ Not necessarily — 10 trials is far too few
- ☐ Yes, 7 > 5
- ☐ It can never be decided

Answer: Not necessarily — 10 trials is far too few
Short runs vary a great deal.

17 What happens as the number of trials increases? **[2]**

- ☐ Experimental probability moves away from theoretical
- ☐ Experimental probability usually moves closer to theoretical
- ☐ Nothing changes
- ☐ It becomes exact

Answer: Experimental probability usually moves closer to theoretical
The same idea as sample size in Unit 6.

18 To find the probability of a drawing pin landing point-up, you should … **[2]**

- ☐ use favourable ÷ total
- ☐ carry out many trials
- ☐ guess 1/2
- ☐ it cannot be found

Answer: carry out many trials
The two outcomes are not equally likely.

19 A spinner gives a 3 on 24 of 80 spins. What is the experimental probability as a percentage? **[3]**

Answer: 30
24 ÷ 80 = 30%.

20 A factory finds 3 faulty items in 150. What percentage is faulty? **[2]**

Answer: 2
3 ÷ 150 = 2%.

21 A letter is chosen at random from MATHEMATICS. What is the probability it is an M? **[2]**

Answer: 2/11
11 letters, two of them M.

Total: 41 marks