nexamind EDUCATION

Name _____ Date _____

13.1 The probability scale — worksheet

Use the language of probability and place events on the 0-to-1 scale, in words, fractions, decimals and percentages. · 47 questions · Show your working.

Remember

• Every probability lies between **0 and 1**. Nothing is less likely than impossible or more likely than certain.
• **0 = impossible**, **1/2 = even chance**, **1 = certain**.
• A probability can be written as a **fraction, a decimal or a percentage** — all three mean the same thing.
• 0.2 = 1/5 = 20%. Convert to one form before comparing.
• Words like “probably” mean different things to different people; a number does not.
• An **outcome** is one possible result; an **event** is the outcome or outcomes you care about.
• An event and its opposite have probabilities that **add to 1**.
• A probability of 1/2 does not promise that exactly half of any set of trials will succeed.

A · Fluency — Describe, and convert between forms.

1 How likely is it that **the sun will rise tomorrow**?
- ☐ impossible
- ☐ unlikely
- ☐ even chance
- ☐ likely
- ☐ certain

2 How likely is it that **you will roll a 7 on an ordinary dice**?
- ☐ impossible
- ☐ unlikely
- ☐ even chance
- ☐ likely
- ☐ certain

3 How likely is it that **a fair coin lands on heads**?
- ☐ impossible
- ☐ unlikely
- ☐ even chance
- ☐ likely
- ☐ certain

4 How likely is it that **it will snow in the Sahara tomorrow**?
- ☐ impossible
- ☐ unlikely
- ☐ even chance
- ☐ likely
- ☐ certain

5 How likely is it that **a baby born today is a boy**?
- ☐ impossible
- ☐ unlikely
- ☐ even chance
- ☐ likely
- ☐ certain

6 How likely is it that **a randomly chosen day of the week is a weekday**?
- ☐ impossible
- ☐ unlikely
- ☐ even chance
- ☐ likely
- ☐ certain

7 How likely is it that **you will live to be 500 years old**?
- ☐ impossible
- ☐ unlikely
- ☐ even chance
- ☐ likely
- ☐ certain

8 How likely is it that **a randomly chosen month has 30 or 31 days**?
- ☐ impossible
- ☐ unlikely
- ☐ even chance
- ☐ likely
- ☐ certain

9 How likely is it that **a dice lands on an even number**?
- ☐ impossible
- ☐ unlikely
- ☐ even chance
- ☐ likely
- ☐ certain

10 How likely is it that **a randomly chosen letter of the alphabet is a vowel**?
- ☐ impossible
- ☐ unlikely
- ☐ even chance
- ☐ likely
- ☐ certain

11 How likely is it that **water boils when heated enough**?

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

12 How likely is it that **a randomly chosen card from a pack is a heart**?

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

13 A probability is ¹$_2$. What is it as a decimal, to 2 decimal places?

14 A probability is ¹$_4$. What is it as a decimal, to 2 decimal places?

15 A probability is ³$_4$. What is it as a decimal, to 2 decimal places?

16 A probability is ¹$_6$. What is it as a decimal, to 2 decimal places?

17 A probability is ⁵$_6$. What is it as a decimal, to 2 decimal places?

18 A probability is ¹$_3$. What is it as a decimal, to 2 decimal places?

19 A probability is ²$_3$. What is it as a decimal, to 2 decimal places?

20 A probability is ¹$_5$. What is it as a decimal, to 2 decimal places?

21 A probability is ⁷$_{10}$. What is it as a decimal, to 2 decimal places?

22 A probability is ¹$_{10}$. What is it as a decimal, to 2 decimal places?

23 A probability is 50%. Write it as a fraction in its simplest form.

24 A probability is 25%. Write it as a fraction in its simplest form.

25 A probability is 75%. Write it as a fraction in its simplest form.

26 A probability is 20%. Write it as a fraction in its simplest form.

27 A probability is 10%. Write it as a fraction in its simplest form.

28 A probability is 80%. Write it as a fraction in its simplest form.

B · Reasoning — The limits of the scale, and why numbers beat words.

29 What is the smallest a probability can be?
- ☐ −1
- ☐ 0
- ☐ 1
- ☐ There is no smallest

30 What is the largest a probability can be?
- ☐ 1
- ☐ 10
- ☐ 100
- ☐ There is no largest

31 What does a probability of 0.5 mean?
- ☐ It will definitely happen
- ☐ It is just as likely to happen as not
- ☐ It will not happen
- ☐ It happens half the time exactly

32 Which is the most likely: a probability of 0.2, 1/5 or 20%?
- ☐ 0.2
- ☐ 1/5
- ☐ 20%
- ☐ They are all the same

33 Can a probability be 1.5?
- ☐ Yes
- ☐ No

34 Can a probability be written as a percentage?
- ☐ Yes
- ☐ No

35 An event has probability 0.9. How would you describe it?
- ☐ impossible
- ☐ unlikely
- ☐ even chance
- ☐ very likely

36 Why is “it will probably rain” not precise enough in maths?
- ☐ It is too long
- ☐ Different people mean different things by “probably”
- ☐ Rain cannot be measured
- ☐ It is precise enough

C · Challenge — Ordering across different forms.

37 An event has probability 3/8. What is that as a percentage?

38 An event has probability 0.35. What is that as a percentage?

39 An event has probability 65%. Write it as a fraction in its simplest form.

40 Put these in order, most likely first: 0.4, 1/3, 45%.

- ☐ 0.4, 1/3, 45%
- ☐ 45%, 0.4, 1/3
- ☐ 1/3, 0.4, 45%
- ☐ 45%, 1/3, 0.4

41 An event and its opposite have probabilities that add to 1. One is 0.3. What is the other?

D · Word problems — Coins, bags, forecasts and games.

42 A bag holds only red counters. How likely is drawing a red one?

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

43 A bag holds only red counters. How likely is drawing a blue one?

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

44 A fair coin is tossed. How likely is a tail?

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

45 A weather forecast says 70% chance of rain. What is the chance of no rain, as a percentage?

46 A game says you win 1 time in 4. What is that as a percentage?

47 A test has a 0.8 pass rate. What percentage fail?