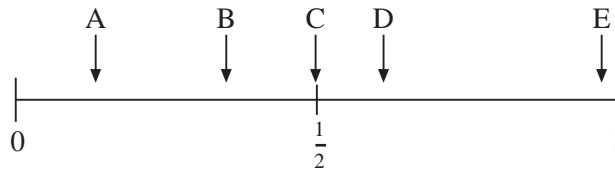


UNIT 21 *Probability of One Event*

Extra Exercises 21.1

1. This probability line shows the probabilities of 5 events, A, B, C, D and E:



- (a) Which event is *unlikely* to take place?
 (b) Which event is *almost certain* to take place?
 (c) Which event has an *even chance* of taking place?
 (d) Which of the events B and D is *most likely* to take place?
2. The events A, B, C, D and E are described below:

A : it will rain tomorrow

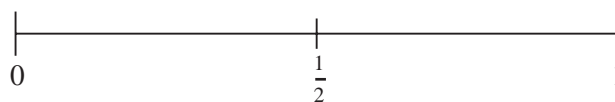
B : it will snow tomorrow

C : it will be very hot tomorrow

D : the temperature will be below freezing tomorrow

E : there will be a hailstorm tomorrow

Mark the probability of each event on a probability line like the one below:



3. Describe an event that is:
- (a) *almost certain*,
 (b) *almost impossible*,
 (c) has an *even chance*.

UNIT 21 *Probability of One Event***Extra Exercises 21.2**

1. There are 14 boys and 16 girls in a class. The headteacher selects one pupil at random. What is the probability that this pupil is:
 - (a) a girl,
 - (b) a boy?

2. A bag contains 8 blue sweets, 7 red sweets and 5 green sweets. A sweet is taken at random from the bag. What is the probability that it is:
 - (a) blue,
 - (b) red,
 - (c) green,
 - (d) yellow,
 - (e) red *or* green,
 - (f) blue *or* red?

3. A letter is selected at random from the word

F I B O N A C C I

What is the probability that the letter is:
 - (a) A,
 - (b) C,
 - (c) I,
 - (d) a vowel?

4. A tennis club has 100 members. Of these, 65 are adults and the rest are children. A member is selected at random. What is the probability that this member is a child?

UNIT 21 *Probability of One Event***Extra Exercises 21.3**

1. Jasmin tosses a fair coin 200 times and obtains 108 heads. Calculate the relative frequency that can be used to estimate the probability of obtaining:
- (a) a head,
- (b) a tail.

2. The numbers of goals scored by a famous footballer in 30 matches are:

0	2	1	0	1	3	2	1	1	1
4	1	1	2	1	2	0	0	0	1
1	1	0	2	0	0	2	1	1	3

From this data, estimate the probability that, in one match, he:

- (a) scores *no* goals,
- (b) scores *one or more* goals,
- (c) scores *three or more* goals.
3. Alex keeps daily records of whether or not it rains in the month of April.

R = Rain

D = Dry

R	R	R	D	R	R	R	D	D	D
D	R	D	R	R	D	D	D	D	R
R	R	R	D	D	D	D	D	D	R

From this data, estimate the probability that it:

- (a) rains on a day in April,
- (b) does not rain on a day in April.

UNIT 21 *Probability of One Event***Extra Exercises 21.4**

1. The probability that a school hockey team scores at least one goal in a match is 0.6. What is the probability that the team does *not* score any goals?

2. The probability that a train is late is 0.02. What is the probability that it is *not* late?

3. A card is taken at random from a complete pack of playing cards. The probability that it is a 7 is $\frac{1}{13}$. What is the probability the it is *not* a 7 ?

4. A packet of sweets contains 8 red sweets out of a total of 40. A sweet is taken at random from the packet.
 - (a) What is the probability that the sweet is red?
 - (b) What is the probability that it is *not* red?

5. The probability that a football team wins their next match is 0.3 and the probability that they lose is 0.4.
What is the probability that they draw their next match?

6. The probability that a trick coin lands heads up is 0.85. What is the probability that it lands tails up?

UNIT 21 *Probability of One Event***Extra Exercises 21.5**

1. If you tossed a fair coin 700 times, how many heads would you expect to get?

2. If you rolled a fair dice 240 times, how many times would you expect to get:
 - (a) a 6,
 - (b) an even number,
 - (c) a prime number,
 - (d) a multiple of 3 ?

3. The probability that a school bus is late is 0.04. How many times would you expect the bus to be late in a 5-week period?

4. The probability that Ben beats his Grandad at a game of Othello is 0.2. If they play 10 games, how many can Ben expect to win?

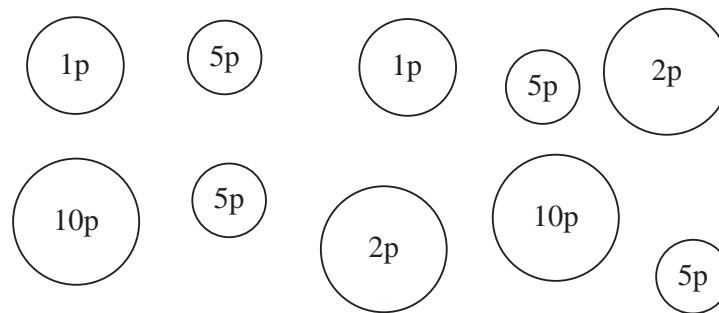
5. Stuart's calculator has a fault and sometimes gives the wrong answer. He finds that the probability of getting a correct answer is $\frac{9}{10}$. How many wrong answers can he expect if he does 40 calculations?

UNIT 21 *Probability of One Event*

Extra Exercises 21.6

- A bag contains 8 pink balls, 3 red balls and 9 purple balls. A ball is taken at random from the bag. What is the probability that it is:
 - pink,
 - red,
 - purple,
 - pink *or* red,
 - pink *or* purple,
 - red *or* purple?

- Emma's money box contains the coins shown below:

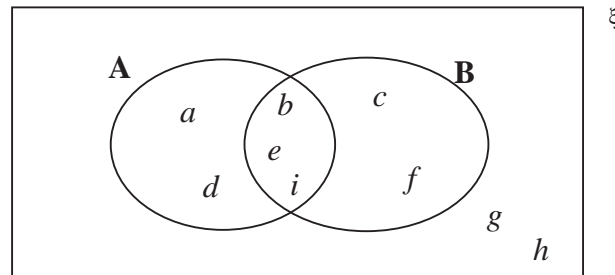


- She takes a coin out of her money box at random. What is the probability that the coin is:
- a 10p *or* a 5p,
 - a 1p *or* a 2p,
 - a 1p *or* a 10p,
 - a 2p *or* a 5p ?
-
- A packet contains 20 sweets, which includes 6 mint creams. The probability that a sweet taken at random from the packet is an éclair is $\frac{1}{4}$. What is the probability that a sweet taken at random from the bag is an éclair *or* a mint cream?

UNIT 21 *Probability of One Event*

Extra Exercises 21.7

1. The letters a, b, c, d, e, f, g, h and i are sorted into sets A and B, as shown in the Venn diagram below:



One of these letters is chosen at random. Calculate the probability that this letter is a member of:

- A,
 - B,
 - A and B,
 - A or B.
2. One of the numbers 1 to 20 is chosen at random. What is the probability that it is:
- an odd number,
 - a prime number,
 - an odd number *and* a prime number,
 - an odd number *or* a prime number.
3. If $p(A) = \frac{1}{2}$, $p(B) = \frac{3}{4}$ and $p(A \text{ or } B) = \frac{7}{8}$, determine $p(A \text{ and } B)$.
4. If $p(A) = \frac{1}{3}$, $p(B) = \frac{1}{4}$ and $p(A \text{ and } B) = \frac{1}{6}$, determine $p(A \text{ or } B)$.

Extra Exercises 21.1

Answers

1. (a) A (b) E (c) C (d) D

Extra Exercises 21.2

Answers

1. (a) $\frac{8}{15}$ (b) $\frac{7}{15}$
2. (a) $\frac{2}{5}$ (b) $\frac{7}{20}$ (c) $\frac{1}{4}$
(d) 0 (e) $\frac{3}{5}$ (f) $\frac{3}{4}$
3. (a) $\frac{1}{9}$ (b) $\frac{2}{9}$ (c) $\frac{2}{9}$ (d) $\frac{4}{9}$
4. $\frac{35}{100} = \frac{7}{20}$

Extra Exercises 21.3

Answers

1. (a) $\frac{27}{50}$ (b) $\frac{23}{50}$
2. (a) $\frac{4}{15}$ (b) $\frac{11}{15}$ (c) $\frac{1}{10}$
3. (a) $\frac{7}{15}$ (b) $\frac{8}{15}$

Extra Exercises 21.4

Answers

1. 0.4
2. 0.98
3. $\frac{12}{13}$
4. (a) $\frac{1}{5}$ (b) $\frac{4}{5}$
5. 0.3
6. 0.15
-

Extra Exercises 21.5

Answers

1. (a) 350
2. (a) 40 (b) 120 (c) 120 (d) 80
3. 1
4. 2
5. 4

Extra Exercises 21.6

Answers

1. (a) $\frac{2}{5}$ (b) $\frac{3}{20}$ (c) $\frac{9}{20}$
(d) $\frac{11}{20}$ (e) $\frac{17}{20}$ (f) $\frac{3}{5}$
2. (a) $\frac{3}{5}$ (b) $\frac{2}{5}$ (c) $\frac{2}{5}$ (d) $\frac{3}{5}$
3. $\frac{11}{20}$

Extra Exercises 21.7

Answers

1. (a) $\frac{5}{9}$ (b) $\frac{5}{9}$ (c) $\frac{1}{3}$ (d) $\frac{7}{9}$
2. (a) $\frac{1}{2}$ (b) $\frac{8}{20} = \frac{2}{5}$ (c) $\frac{7}{20}$ (d) $\frac{11}{20}$
3. $\frac{3}{8}$
4. $\frac{5}{12}$