Probability - GRADE 10
Exercises - A

Exercise A

QUESTION 8

8.1 At a certain school there are 64 boys in Grade 10. Their sport preferences are indicated below:

- 24 boys play soccer
- 28 boys play rugby
- 10 boys play both soccer and rugby
- 22 boys do not play soccer or rugby

8.1.1 Represent the information above in a Venn diagram.

8.1.2 Calculate the probability that a Grade 10 boy at the school, selected at random, plays:

(a) Soccer and rugby

(b) Soccer or rugby

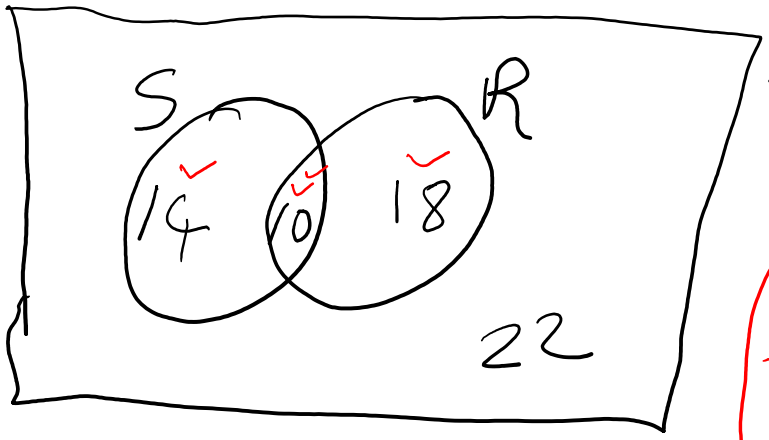
8.1.3 Are the events a Grade 10 boy plays soccer at the school and a Grade 10 boy plays rugby at the school, mutually exclusive? Justify your answer.

Identity:

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

Solutions

8.1.1



Sample Space

8.1.2(b)

$\frac{14+10+18}{64}$

$= 0,66$

8.1.2(a) $\frac{10}{64} = 0,16$

(b) $P(S \text{ or } R) = P(S) + P(R) - P(S \text{ and } R)$

$= \frac{24}{64} + \frac{28}{64} - 0,16$

$= 0,66$

Probability - GRADE 10
Exercises - A

Exercise A

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Mutually exclusive

$P(A \text{ and } B) = 0$

8.1.3 $P(S \text{ and } R) = 0,16$

$\therefore P(S \text{ and } R) \neq 0$

$\therefore$ No, the events are not mutually exclusive.

Probability - GRADE 10
Exercises - A

Exercise A

8.2 One morning Samuel conducted a survey in his residential area to establish how many passengers, excluding the driver, travel in a car. The results are shown in the table below:

Number of passengers, excluding the driver	0	1	2	3	4
Number of cars	7	11	6	5	1

Calculate the probability that, excluding the driver, there are more than two passengers in a car.

8.3 If you throw two dice at the same time, the probability that a six will be shown on one of the dice is $\frac{10}{36}$ and the probability that a six will be shown on both the dice, is $\frac{1}{36}$. What is the probability that a six will NOT show on either of the dice when you throw two dice at the same time?

8.2 Sample space $= 7+11+6+5+1$
$= 30$

$\therefore \frac{5}{30} + \frac{1}{30} = \frac{1}{5} = 0,2$

8.3 $1 - P(\text{six show})$

$= 1 - \left(\frac{10}{36} + \frac{1}{36}\right)$

$= \frac{25}{36}$

$= 0,69$

Probability - GRADE 10
Exercises - B

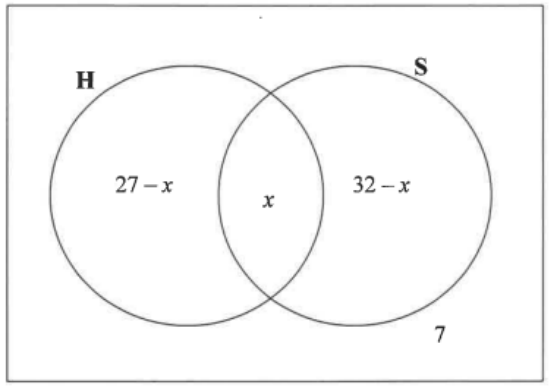
Exercise B

QUESTION 8

8.1 In a certain class of 42 boys:

- 27 play hockey (H)
- 32 play soccer (S)
- 7 do not play hockey or soccer
- An unknown number (x) play both hockey and soccer

The information is represented in the Venn diagram below.



8.1.1 Calculate the value of x.

8.1.2 If a boy from the class is chosen at random, calculate the probability that he:

(a) Does not play hockey or soccer

(b) Plays only soccer

Solutions

8.1.1 $27-x+x+32-x+7=42$

$66-x=42$

$66-42=x$

$24=x$

$\therefore x=24$

8.1.2 (a) $\frac{7}{42}=0,17$

(b) $\frac{32-24}{42}=0,19$

Probability - GRADE 10
Exercises - B

Exercise B

8.2 A bag contains 3 blue balls and x yellow balls.

8.2.1 Write down the total number of balls in the bag.

8.2.2 If a ball is drawn from the bag, write down the probability that it is blue.

8.3 8.3.1 Complete the following statement:

If A and B are two mutually exclusive events, then P (A and B) = ...

8.3.2 Given that A and B are mutually exclusive events. The probability that event A occurs is 0,55. The probability that event B does not occur is 0,7.

Calculate P (A or B).

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$P(A \text{ or } B) = P(A) + P(B) - 0$

8.2.1 $x + 3$

8.2.2 $\frac{3}{(x+3)}$

8.3.1 $P(A \text{ and } B) = 0$

8.3.2 $P(\text{not } B) = 0,7$

$P(B) = 1 - P(\text{not } B)$

$= 1 - 0,7$

$= 0,3$

A and B are mutually exclusive $\therefore P(A \text{ and } B) = 0$

$\therefore P(A \text{ or } B) = P(A) + P(B) - 0$

$= 0,55 + 0,3 = 0,85$

Probability - GRADE 10
Exercises - C

Exercise C

QUESTION 7

7.1 Two events, A and B, are complementary and make up the entire sample space. Also, $P(A') = 0{,}35$.

7.1.1 Complete the statement: $P(A) + P(B) = \ldots$

7.1.2 Write down the value of $P(A \text{ and } B)$.

7.1.3 Write down the value of $P(B)$.

7.2 A survey was conducted among 150 learners in Grade 10 at a certain school to establish how many of them owned the following devices: smartphone (S) or tablet (T).

The results were as follows:

- 8 learners did not own either a smartphone or a tablet.
- 20 learners owned both a smartphone and a tablet.
- 48 learners owned a tablet.
- x learners owned a smartphone.

7.2.1 Represent the information above in a Venn diagram.

7.2.2 How many learners owned only a smartphone?

7.2.3 Calculate the probability that a learner selected at random from this group:

(a) Owned only a smartphone

(b) Owned at most one type of device

Solutions

7.1.1 $P(A) + P(B) = 1$

7.1.2 $P(A \text{ and } B) = 0$

7.1.3 B is A'

$P(B) = P(A')$

$= 0{,}35$

Probability - GRADE 10
Exercises - C

Exercise C

QUESTION 7

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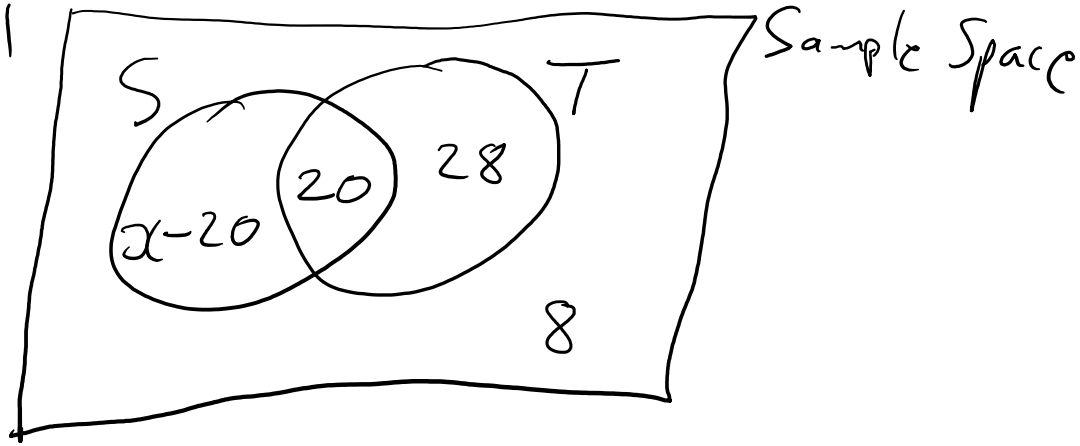
7.2.1



Sample Space

7.2.2 $x - 20 + 20 + 28 + 8 = 150$

$x = 114$

$\therefore \text{only}(S) = 114 - 20 = 94$

7.2.3 (a) $\frac{94}{150} = 0{,}63$

(b) $\frac{94}{150} + \frac{28}{150} + \frac{8}{150} = 0{,}87$