

- 1 Which statement is true?
- A) Probability is always in between -1 and 1.
 B) Probability is defined as favorable outcomes to unfavorable outcomes.
 C) Probability is assigned a value of 1 if the event is not going to occur.
 D) If $P(A) = r$ then $P(\bar{A}) = 1 - r$
- 2 A soccer player has 21 attempts on net and score 7 goals. What are the odds in favor of her scoring on her next attempt?
- A) 1:2
 B) 2:1
 C) 1:3
 D) 3:1
- 3 The odds against Mark winning a country race is 1:4. What is the probability that he will win the race?
- A) .2
 B) .25
 C) .8
 D) 4
- 4 A committee of 3 people is randomly chosen from a group of 10 people: 7 male and 3 female. Which statement would be correct for determining the probability that the committee would contain at least 1 male and at least 1 female on the committee?
- A) $\frac{{}_7P_1 {}_3P_1 + {}_7P_2 {}_3P_1}{{}_{10}P_3}$
 B) $\frac{{}_7C_1 {}_3C_2 + {}_7C_2 {}_3C_1}{{}_{10}C_3}$
 C) $\frac{{}_7P_1 {}_3P_1 \cdot {}_7P_2 {}_3P_1}{{}_{10}P_3}$
 D) $\frac{{}_7C_1 {}_3C_1 \cdot {}_7C_2 {}_3C_1}{{}_{10}C_3}$
- 5 A and B are mutually exclusive events. $P(A \cup B) = 91\%$. If $P(A) = 0.60$, what is the probability of B NOT occurring, $P(\bar{B})$?
- A) 9%
 B) 40%
 C) 49%
 D) 51%
- 6 The forecaster predicts there is a 40% chance of precipitation tomorrow. What are the odds against rain tomorrow?
- A) 2:5
 B) 5:2
 C) 2:3
 D) 3:2

- 7 You have a six sided die with each numbered 1 to 6. If you toss a coin and the die in the air the same time, what is the probability of getting a number less than 3 and tails showing on the coin?

- A) $\frac{1}{12}$
 B) $\frac{1}{6}$
 C) $\frac{3}{8}$
 D) $\frac{5}{6}$

- 8 A deck of 40 cards consists of 4 different coloured sets: red, blue, green and yellow. Each set is numbered from 0 to 9 as shown below. If two cards are randomly picked from the deck, what is the probability that the first card is blue or green and the second card is also blue or green?

Card Colour	Cards
red	0 1 2 3 4 5 6 7 8 9
blue	0 1 2 3 4 5 6 7 8 9
green	0 1 2 3 4 5 6 7 8 9
yellow	0 1 2 3 4 5 6 7 8 9

- (A) $\frac{1}{20}$
 (B) $\frac{19}{80}$
 (C) $\frac{19}{78}$
 (D) $\frac{1}{4}$
- 9 Which events are independent?
- A) $P(A) = .7$ $P(B) = .6$, $P(A \cap B) = .28$
 B) $P(A) = .5$ $P(B) = .5$, $P(A \cap B) = 1$
 C) $P(A) = .25$ $P(B) = .25$, $P(A \cap B) = 1$
 D) $P(A) = 1$ $P(B) = 0$ $P(A \cup B) = 0$

Nine boys and twelve girls have signed up for a trip. Only six students will be selected to go on the trip. Determine the probability that only boys will be on the trip.

- A. 0.02%
- B. 0.08%
- C. 0.15%
- D. 0.23%

- 11 Two cards are withdrawn from a standard deck of 52 playing cards. What is the probability that two cards drawn from the deck are spades given that the first card is not replaced?

- A) 6.25%
- B) 5.77%
- C) 6.37%
- D) 5.88%

- 12 A jar contains 10 red marbles and some green marbles. The odds against drawing a green marble are 1:4. Determine the total number of marbles in the bag?

- A) 10
- B) 14
- C) 40
- D) 50

- 13 Event A is choosing a red card from a standard deck of cards. Event B is selecting a red card again. Compute $P(B|A)$.

- A) $\frac{650}{2652}$
- B) $\frac{1}{2}$
- C) $\frac{25}{51}$
- D) $\frac{625}{2652}$

Part II Show ALL Workings!

- 1 If a five digit security code is generated at random from the following digits 2,3,4,5, 8, with NO repetition, what is the probability that
- A) an odd security code will be generated? 5 marks
- B) an even security code will be generated? 1 mark
- 2 There are 12 teachers and 5 administrators at a conference. There are four prizes that have to be awarded.
- A) Determine the total number of ways this can be achieved. 3 marks
- B) What is the probability that the four prizes will be awarded to teachers only? 4 marks
- C) What is the probability of at least 3 administrators receiving prizes? 6 marks

- 3 Alex, Bob, Carrie, Donnie, Eli, and Fergus are standing in a straight line. Determine the probability that Donnie and Eli are standing together when the line is formed. 6 marks
- 4 A person will be randomly selected from a group to draw a marble out of a bag. The odds of selecting a male from the group are 7: 16. The odds of selecting a red marble from the bag are 1:4. What is the probability of selecting a non-red marble from the bag by a female member of the group? (AND is occurring!) 6 marks
- 5 60% of students at a certain High School Play Sports. 35% play a musical instrument while 25% do neither. Draw a Venn diagram to represent this situation and use it to determine what is the probability a student plays a sport or a musical instrument. 6 marks

- 6 Tommy likes to jog. If the weather is nice he will likely jog 90% of the time. If the weather is not nice he only jogs 40% of the time. The weather tomorrow has a 60% chance of rain. Determine the probability that Tom will jog tomorrow. 7 marks

End

$$n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(A \cap C) + n(A \cap B \cap C)$$

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

$${}^n P_r = \frac{n!}{(n-r)!}$$

$${}^n C_r = \binom{n}{r} = \frac{n!}{(n-r)!r!}$$

$$\frac{n!}{a!b!c!\dots}$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

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

$$P(A \cap B) = P(A) \cdot P(B|A)$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$