## PM 12 – Probability PED Questions
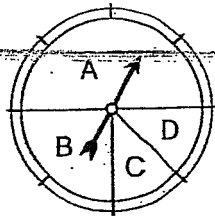
1. When the pointer is spun, determine the probability that the pointer will stop on section C.



a) $\frac{1}{8}$          b) $\frac{1}{4}$

c) $\frac{1}{3}$          d) $\frac{1}{2}$

2. Three cards are dealt from a standard deck of 52 cards. Determine the probability of getting at least one diamond.

    a) 0.41          b) 0.44          c) 0.59          d) 0.75

3. An experiment consists of tossing a fair coin and rolling a fair die. What is the probability of obtaining a head and a 5?

    a) $\frac{1}{12}$          b) $\frac{1}{10}$          c) $\frac{7}{12}$          d) $\frac{2}{3}$

4. Six people are randomly selected from a group of 8 males and 10 females to form a committee. Determine the probability that exactly 4 males are selected for this committee.

    a) 0.01          b) 0.10          c) 0.17          d) 0.32

5. A card is randomly drawn from a standard 52-card deck. Determine the probability that the card drawn is a red ace.

    a) $\frac{1}{26}$          b) $\frac{1}{13}$          c) $\frac{2}{13}$          d) $\frac{4}{13}$

6. Five balls are randomly drawn without replacement from a bag containing 4 red balls and 6 black balls. What is the probability that at least 3 red balls will be drawn?

    a) 0.0238          b) 0.2381          c) 0.2619          d) 0.7381

7. When rolling 2 fair six-sided dice, what is the probability of obtaining a sum that is at most 4?

    A) $\frac{1}{12}$          b) $\frac{5}{36}$          c) $\frac{1}{6}$          d) $\frac{5}{6}$

8. In the diagram below, each spinner is spun once and the resulting numbers are added. What is the probability that the sum is an odd number?
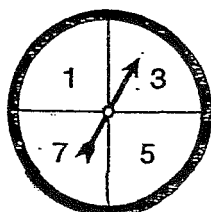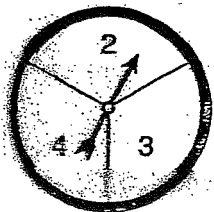


a) $\frac{5}{12}$          b) $\frac{1}{2}$

c) $\frac{2}{3}$          d) $\frac{5}{7}$

9. A 7-card hand is dealt from a standard deck of 52 cards. What is the probability that the hand will contain 3 clubs and 4 red cards?

   a) 0.0015       b) 0.0246       c) 0.0320       d) 0.2905

10. If a fair six-sided die is tossed twice, what is the probability that the first toss will be a number less than 3 and the second toss will be a number more than 3?

   a) $\frac{1}{9}$       b) $\frac{1}{6}$       c) $\frac{1}{4}$       d) $\frac{5}{6}$

11. If 5 cards are dealt from a standard deck of 52 cards, determine the probability of obtaining 3 red cards and 2 black *face* cards.

   a) 0.0010       b) 0.0150       c) 0.0660       d) 0.3251

12. Two fair six-sided dice are rolled and the face values are added. What is the probability of obtaining a sum that is an even number less than 8?

   a) $\frac{1}{4}$       b) $\frac{7}{18}$       c) $\frac{1}{2}$       d) $\frac{7}{12}$

13. There are 10 horses in a race. A particular bet requires a customer to choose the first three horses in the correct finishing order. If all 10 horses have an equal chance of finishing in any position, determine the probability that a single bet wins.

   a) 0.0014       b) 0.0083       c) 0.125       d) 0.3

14. A hand of five cards is dealt from a standard deck of 52 cards.

   a) What is the probability that the hand contains exactly 1 club? (2m)

   b) What is the probability that the hand contains at most 1 club? (2m)

15. In a group of 100 children, 35 children liked beans, 25 liked both beans and peas, and 5 liked neither beans nor peas. What is the probability that a randomly selected child from this group will like only peas?

   a) 0.1       b) 0.35       c) 0.45       d) 0.6

16. In a recent survey, it was determined that out of 100 people, 70 had eaten Chinese food in the last year, 22 had eaten Italian food, and 20 had eaten neither. How many people had eaten both Chinese and Italian food in the last year?

   a) 8       b) 10       c) 12       d) 28

17. A bag contains 4 white balls and 6 black balls. Two balls are drawn one at a time without replacement. What is the probability that both balls are the same colour?

    a) $\dfrac{2}{15}$          b) $\dfrac{1}{3}$          c) $\dfrac{7}{15}$          d) $\dfrac{8}{15}$

18. On Friday, the probability that the Flyers win their game in Prince George is $\dfrac{5}{9}$ and the probability that the Bears win their game in Smithers is $\dfrac{12}{17}$. Assuming independence, what is the probability that on Friday, the Flyers win their game and the Bears do not win their game?

    a) $\dfrac{20}{153}$          b) $\dfrac{25}{153}$          c) $\dfrac{105}{153}$          d) $\dfrac{130}{153}$

19. A survey of people that live within 40 km of a ski resort found that 22% go snowboarding, 48% go skiing, and 6% do both sports. Determine the probability that a randomly selected person does neither sport.
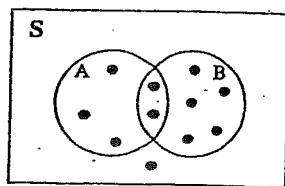
    a) 24%          b) 30%          c) 36%          d) 42%

20. In a recent survey of grade 12 students, it was found that 72% took mathematics and 53% took chemistry. If 77% took mathematics or chemistry, what percent of students took mathematics only?

    a) 5%          b) 19%          c) 24%          d) 48%

**Use the following diagram to answer question 21.**

The diagram shows the sample space S of 11 equally likely outcomes.



21. Determine $P(\overline{A})$.

    a) $\dfrac{1}{11}$          b) $\dfrac{5}{11}$

    c) $\dfrac{6}{11}$          d) $\dfrac{8}{11}$

22. It is known that 1% of the population has a certain disease. A test for this disease is 95% accurate. This means that the outcome of the test is correct 95% of the time. What is the probability that a randomly selected person tests negative?

    a) 0.940          b) 0.941          c) 0.945          d) 0.950

23. A bag contains 4 yellow balls and $n$ red balls. Two balls are drawn from the bag, one after the other, without replacement. Which expression represents the probability that one ball is yellow and one ball is red?

    a) $\left(\dfrac{4}{n+4}\right)\left(\dfrac{n-1}{n+3}\right)+\left(\dfrac{n-1}{n+4}\right)\left(\dfrac{3}{n+3}\right)$          b) $\left(\dfrac{4}{n+4}\right)\left(\dfrac{n}{n+3}\right)+\left(\dfrac{n}{n+4}\right)\left(\dfrac{4}{n+3}\right)$

    c) $\left(\dfrac{4}{n+4}\right)\left(\dfrac{n}{n+3}\right)+\left(\dfrac{n-1}{n+4}\right)\left(\dfrac{3}{n+3}\right)$          d) $\left(\dfrac{4}{n+4}\right)\left(\dfrac{3}{n+3}\right)+\left(\dfrac{n}{n+4}\right)\left(\dfrac{4}{n+3}\right)$

24. A bag contains 4 red marbles and 5 blue marbles. If two marbles are drawn from the bag without replacement, determine the probability that they are both red.

   a) $\frac{4}{27}$      b) $\frac{1}{6}$      c) $\frac{5}{18}$      d) $\frac{59}{72}$

25. Two cards are drawn without replacement from a standard deck of 52 cards. What is the probability that the first card is a face card and the second card is a queen?

   a) $\frac{11}{663}$      b) $\frac{3}{169}$      c) $\frac{3}{221}$      d) $\frac{4}{221}$

26. Two fair coins are tossed. What is the probability that both coins are heads, given that at least one of them is a head?

   a) $\frac{1}{4}$      b) $\frac{1}{3}$      c) $\frac{1}{2}$      d) $\frac{3}{4}$

27. The probability of having type A disease is 6%. The test to determine if a person has type A disease is 80% accurate. This means that the outcome of the test is correct 80% of the time. What is the probability that a randomly selected person tests positive?
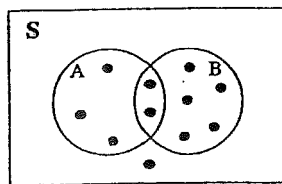
   a) 0.048      b) 0.236      c) 0.752      d) 0.80

**Use the following diagram to answer question 28.**

The diagram shows the sample space S of 11 equally likely outcomes.



28. Determine $P(B \mid A)$.

   a) $\frac{2}{11}$      b) $\frac{2}{7}$

   c) $\frac{2}{5}$      d) $\frac{7}{11}$

29. Jar A contains 5 red balls and 7 white balls. Jar B contains 8 red balls and 4 white balls. A fair die is rolled. If a 1 or a 2 comes up, a ball is randomly selected from Jar A, otherwise, a ball is randomly selected from Jar B.

   a) Find the probability that a white ball is selected. (2 m)

   b) Given that the ball selected is white, find the probability that it came from Jar A. (2 m)

30. A building supply store buys 40% of its pine boards from sawmill A and 60% from sawmill B. Due to pine beetle infestation, 7% of the boards from sawmill A and 5% from sawmill B have a blue discoloration. If a randomly picked board is discolored, what is the probability that it came from sawmill A?  (4 m)

31. Bag A contains 5 white balls and 2 green balls. Bag B contains 3 white balls and 4 green balls. A fair die is rolled and if a 1 or 2 comes up, a ball is randomly selected from Bag A; however, if a 3, 4, 5, or 6 comes up, a ball is randomly selected from Bag B.

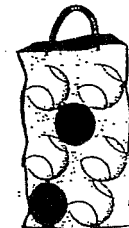    a) What is the probability of selecting a white ball?  (2 m)

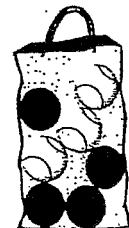    b) If a white ball is selected, what is the probability that this ball came from Bag A?  (2 m)

    Bag A       Bag B

32. Bag M contains 5 white balls and 2 red balls.  Bag N contains 3 white balls and 4 red balls.

    a) A ball is randomly selected from Bag M and placed in Bag N.  A ball is then randomly selected from Bag N.  What is the probability that the ball selected from Bag N is white?  (3 m)

    b) If a white ball is selected from Bag N, what is the probability that a red ball was transferred from Bag M to Bag N?  (1 m)

    Bag M       Bag N

33. In the Canadian Junior Hockey League, 60% of the players are from Eastern Canada and 40% are from Western Canada. From this league, 18% of the Eastern players and 12% of the Western players go on to play in the NHL. If a randomly chosen NHL player who came from the Canadian Junior Hockey League is selected, what is the probability that he is from Western Canada?  (4 m)

34. In one of the provinces, 86% of all homes have a television, 50% of all homes have a television and a stereo, and 2% have neither a television nor a stereo.

    a) What is the probability that a randomly selected home in this province has a stereo?  (2 m)

    b) Given that a randomly selected home in this province has a television, what is the probability that this home does not have a stereo?  (2 m)