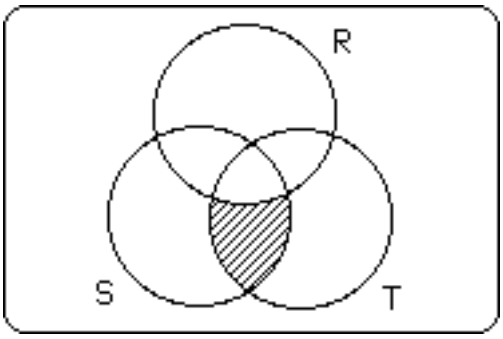

1. The shaded region in the diagram above is.

a. $R' \cap S' \cap T'$ b. $R \cap (S \cap T)'$ c. $S \cap T$

d. $S \cap T \cap R'$ e. $(R \cup S) \cap T$

2. In a survey of a group of students it is found that 100 liked baseball, 150 liked football, 85 liked hockey, 55 liked both baseball and football, 10 liked all 3, 80 liked football but not hockey. How many students liked both football and hockey?

a. 50 b. 70 c. 10 d. 15 e. 20

3. Let S and T be any two sets. Then $T' \cap (S \cup T')' =$

a. $\varnothing$ (the empty set) b. S c. $S \cap T$ d. $S' \cap T$ e. $S' \cap T'$

4. Let the universal set U = {1, 2, 3, 4, 5, 6, 7}, R = {1, 2}, S = {1, 2, 4, 5, 6, 7}. Then $R' \cup S$ =

a. {3} b. $\varnothing$ c. U d. {1, 2, 3,} e. {4, 5, 6, 7}

5. What are the first 3 coefficients of $(x + y)^{27}$?

a. 1, 26, 27 b. 0, 27, 351 c. 1, 27, 351

d. 0, 27, 13 e. 0, 1, 27

6. How many 3 digit sequences (repetitions allowed) can be formed from the numbers {1, 2, 3,}?

a. 8 b. 6 c. 18 d. 3 e. 27

7. Five square tiles of the same size but of different colors (all 5 colors are different) are arranged side by side in a horizontal line. How many different patterns are possible?

a. 2^5 b. 5 c. 5^2 d. 120 e. 100

8. A committee is comprised of 4 mathematicians, 3 chemists and 5 physicists. How many subcommittees of 3 members (with at least one member being a mathematician) can be formed?

a. $4\binom{8}{3}$ b. $\binom{12}{3} - \binom{8}{3}$ c. $\binom{5}{3}$

d. $\binom{4}{1}\binom{8}{2}$ e. 32

9. An urn contains 15 numbered balls. Of these 5 are red, 6 are green and 4 are black. A sample of 3 balls is selected at random. What is the probability that the sample has exactly 1 red ball 1 green ball and 1 black ball?

a. $\frac{3!}{15!}$ b. $\frac{5 \cdot 4 \cdot 3}{\binom{15}{3}}$ c. $\frac{5 \cdot 6 \cdot 4}{2^{15}}$

d. $\frac{2^5 \cdot 2^6 \cdot 2^4}{2^{15}}$ e. $\frac{5 \cdot 6 \cdot 4}{\binom{15}{3}}$

10. Three of 25 new cars are selected at random to check for steering defects. suppose that 7 of the 25 cars have such defects. What is the probability that all 3 of the selected cars are defective?

a. $\frac{\binom{7}{3}}{\binom{25}{3}}$ b. $\frac{\binom{25}{3}}{\binom{25}{7}}$ c. $\frac{\binom{18}{3}}{\binom{25}{3}}$ d. $\frac{\binom{18}{7}}{\binom{25}{7}}$ e. $\frac{(3!)}{\binom{25}{3}}$

11. A die is rolled twice and the number on the upturned faced is recorded after each roll. What is the probability that the Sum of these 2 numbers is 7?

a. $\frac{1}{2}$ b. $\frac{5}{36}$ c. $\frac{31}{36}$ d. $\frac{3}{6}$ e. $\frac{1}{6}$

12. The free-throw success rate of a certain basketball player is 50%. What is the probability that he makes 2 out of 3 free-throws?

a. $3(.5)(.5)(.5)$ b. $3(.5 + .5 + .5)$ c. $(.5)(.5)(.5)$

d. $3(.5)(.5)$ e. 0

13. Let A and B be two events.
If $Pr(A \cup B) = .7$, $Pr(A) = .3$ and $Pr(B) = .4$ then $Pr(A \cap B) =$

a. .3 b. 1 c. .4 d. 0 e. .7

14. A fair coin is tossed 5 times. What is the probability that the first toss and last toss are tails?

a. $\frac{3}{32}$ b. $\frac{1}{4}$ c. $\frac{3}{16}$ d. $\frac{9}{32}$ e. $\frac{1}{32}$

15. Let A and B be 2 events. Given that $Pr(A \cap B) = \frac{1}{5}$, and the conditional probability $Pr(A|B) = \frac{3}{5}$. Then Pr(B) =

a. $\frac{4}{5}$ b. $\frac{1}{5}$ c. $\frac{1}{5}$ d. $\frac{2}{5}$ e. $\frac{1}{3}$

16. There are 5 men and 5 women at a party. How many different pairings into five couples can be formed?

a. 5.4 b. $\binom{5}{2}$ c. 5! d. 5 e. 25

17. Ten teams entered a basketball tournament. Each teams played each of the other teams exactly once. How many games were played at the tournament?

a. 45 b. 100 c. 90 d. 2^{10} e. 20