

Place **ANSWERS ONLY** in the boxes.

- 1) If we randomly rearrange all of the letters of the word PIANO, find the probability that it will end with an N. (4 decimal places) A) .1667 B) .2000 C) .8000 D) .8333 E) None of these
- 2) In a group of 25 people, find the probability that nobody has the same birthday. (4 decimal places)
A) .4313 B) .5687 C) .9315 D) .0685 E) None of these
- 3) In a group of 25 people, find the probability that at least two people share a birthday. (4 decimal places)
A) .4313 B) .5687 C) .9315 D) .0685 E) None of these
- 4) In a group of 15 people, find the probability that everybody was born in a different month.
(4 decimal places) (Assume that the probability of all birth months are equal.)
A) .5000 B) 0.0000 C) .9572 D) 1.0000 E) None of these

(5 – 8) Two of the 52 cards are drawn at random from a standard deck of cards (without replacement); Match the letter of the correct answer on the right with the question on the left. Answers may be used more than once.

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|--------------------------|---|--------------------|-------------------|--------------------|
| <input type="checkbox"/> | 5) Find the probability that exactly one card is a spade. | A) $\frac{1}{52}$ | B) $\frac{1}{51}$ | C) 0 |
| <input type="checkbox"/> | 6) Find the probability that both cards are spades. | D) $\frac{1}{4}$ | E) $\frac{4}{13}$ | F) $\frac{3}{8}$ |
| <input type="checkbox"/> | 7) Find the probability that both are not spades. | H) $\frac{1}{17}$ | K) $\frac{1}{13}$ | M) $\frac{13}{34}$ |
| <input type="checkbox"/> | 8) Find the probability that at least one is a spade. | P) $\frac{13}{68}$ | R) $\frac{2}{17}$ | X) None of these |

- 9) If a four letter password is randomly generated from the alphabet (repetition allowed), then find the probability that it contains a vowel (a, e, i, o, or u). (4 decimal places)
A) .0014 B) .4256 C) .5744 D) .9986 E) None of these
- 10) If $P(A) = .48$ and $P(B | A) = .25$, then find $P(A \cap B)$.
A) .12 B) .23 C) .73 D) .36 E) None of these

(11 – 14) A Bag contains 8 pink, 5 purple, and 3 brown chips. If two chips are selected at random without replacement; Round each answer to 4 decimal places.

- 11) Find the probability that they are both pink.
A) .2333 B) .2500 C) .5000 D) .9667 E) None of these
- 12) Find the probability that at least one is purple.
A) .3125 B) .2292 C) .4583 D) .5417 E) None of these
- 13) Find the probability that they are different colors.
A) .2000 B) .3417 C) .6583 D) .8000 E) None of these

(Problems 14 through 16) A bag of marbles is represented by the following table;

	Red	Blue	White
Small	4	5	7
Medium	2	7	1
Large	3	1	5

(Assume random selection where applicable)

Answer in FRACTION FORM, reduce completely

14) Find the probability that a marble is white and small

15) Find the probability marble is small given that it is blue

16) Find the probability that marble is not red given that it is large

(17 – 20) Let **A and B be independent events**. $P(A) = .74$ and $P(B) = .25$.

17) Find $P(A \cap B)$.
(4 decimal places)

18) Find $P(A \cup B)$.
(4 decimal places)

19) Find $P(A | B)$.
(4 decimal places)

20) Find $P(\bar{A} \cap B)$.
(4 decimal places)