

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 at least two people were born in the same month.
(4 decimal places) (Assume that the probability of all birth months are equal.)
A) 1.2500 B) .8000 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 the first one is a spade. | A) $\frac{1}{52}$ | B) $\frac{1}{51}$ | C) 0 |
| <input type="checkbox"/> | 6) Find the probability that the second one is a spade. | D) $\frac{1}{4}$ | E) $\frac{4}{13}$ | F) $\frac{1}{26}$ |
| <input type="checkbox"/> | 7) Find the probability that both are spades. | H) $\frac{1}{17}$ | K) $\frac{1}{13}$ | M) $\frac{13}{34}$ |
| <input type="checkbox"/> | 8) Find the probability that exactly 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
- 14) Find the probability that exactly one is brown.
A) .3250 B) .3500 C) .1625 D) .1875 E) None of these

- 15) If three cards are selected from a deck (without replacement), then find the probability that exactly two are kings. (4 decimal places)
- A) .0130 B) .0043 C) .0055 D) .0163 E) None of these

(Problems 16 through 18) 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

- 16) Find the probability that a marble is white.
- 17) Find the probability that a red marble is not small.
- 18) Find the probability that a small marble is not red.

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

- 19) Find $P(A \cap B)$.
(4 decimal places)
- 20) Find $P(A \cup B)$.
(4 decimal places)
- 21) Find $P(A | B)$.
(4 decimal places)
- 22) Find $P(\bar{B} | \bar{A})$.
(4 decimal places)
- 23) Find $P(\bar{A} \cap B)$.
(4 decimal places)