Name **TEACHER**

Solve the problem.

1) Which of the following cannot be a probability?

   A) $\frac{\sqrt{5}}{3}$ B) -87   C) 0.001   D) 0

2) Rank the probabilities of 10%, $\frac{1}{5}$, and 0.06 from the least likely to occur to the most likely to occur.

   .06, 10%, $\frac{1}{5}$

3) Identify the sample space of the probability experiment: answering a multiple choice question with A, B, C, and D as the possible answers

   A, B, C, D   4

5.61

4) A single six-sided die is rolled. Find the probability of rolling a number less than 3.

   $P(<3) = \frac{2}{6} = .333$

5) A study of 1000 randomly selected flights of a major airline showed that 782 of the flights arrived on time. What is the probability of a flight arriving on time?

   $\frac{782}{1000} = \frac{391}{500}$

6) In a survey of college students, 880 said that they have cheated on an exam and 1721 said that they have not. If one college student is selected at random, find the probability that the student has cheated on an exam.

$$\frac{880}{2601}$$

7) The distribution of blood types for 100 Americans is listed in the table. If one donor is selected at random, find the probability of selecting a person with blood type A+ or A-.
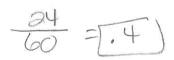
Blood Type	O+	O-	A+	A-	B+	B-	AB+	AB-
Number	37	6	34	6	10	2	4	1

$$\frac{34}{100} + \frac{6}{100} = \frac{40}{100} = \frac{4}{10} \left[\frac{2}{5} \right]$$
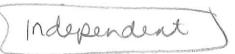
8) A group of students were asked if they carry a credit card. The responses are listed in the table.

Class	Credit Card Carrier	Not a Credit Card Carrier	Total
Freshman	24	36	60
Sophomore	37	3	40
Total	61	39	100

If a student is selected at random, find the probability that he or she owns a credit card given that the student is a freshman. Round your answer to three decimal places.

$$\frac{24}{60} = \boxed{.4}$$

9) Classify the events as dependent or independent.
   The events of getting two aces when two cards are drawn from a deck of playing cards and the first card is replaced before the second card is drawn.

Independent

10) You are dealt two cards successively without replacement from a standard deck of 52 playing cards. Find the probability that the first card is a two and the second card is a ten. Round your answer to three decimal places.
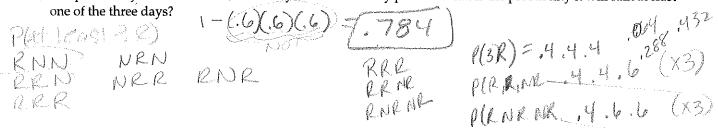
$$P(2) \cdot P(10)$$

$$\frac{4}{52} \cdot \frac{4}{51} = \frac{16}{2652} = \boxed{.006}$$

11) Find the probability of answering the two multiple choice questions correctly if random guesses are made. Assume the questions each have five choices for the answer. Only one of the choices is correct.

$$\frac{1}{5} \cdot \frac{1}{5} = \frac{1}{25} = \boxed{.04}$$

.60

$1 - \widehat{NNN}$

12) The probability it will rain is 40% each day over a three–day period. What is the probability it will rain at least one of the three days?

$$1 - (.6)(.6)(.6) = \boxed{.784}$$
NOT

P(All 3 days) → ②
RNN   NRN
RRN   NRR   RNR
RRR

RRR
RRNR
RNRNR

$P(3R) = .4 \cdot .4 \cdot .4$ .064   .432
.288

$P(R R NR) \rightarrow .4 \cdot .4 \cdot .6$ (x3)

$P(R NR NR) \; .4 \cdot .6 \cdot .6$ (x3)

13) Decide if the events A and B are mutually exclusive or not mutually exclusive. A card is drawn from a standard deck of 52 playing cards.
A: The result is a 7.
B: The result is a jack.

Exclusive

14) A card is drawn from a standard deck of 52 playing cards. Find the probability that the card is an ace or a king.

$$P(A) + P(K)$$

$$\frac{4}{52} + \frac{4}{52} = \frac{8}{52} = \boxed{\frac{2}{13}}$$

15) A card is drawn from a standard deck of 52 playing cards. Find the probability that the card is an ace or a black card.

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

$$\frac{4}{52} + \frac{26}{52} - \frac{2}{52} = \frac{28}{52} \boxed{\frac{7}{13}}$$

3

16) The table lists the smoking habits of a group of college students.

Sex	Non-smoker	Regular Smoker	Heavy Smoker	Total
Man	135	46	5	186
Woman	187	21	11	219
Total	322	67	16	405

If a student is chosen at random, find the probability of getting someone who is a regular or heavy smoker. Round your answer to three decimal places.
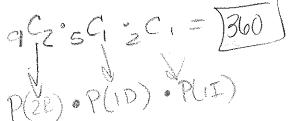
$$P(R) + P(HS)$$

$$\frac{67}{405} + \frac{16}{405} = \frac{83}{405} = \boxed{.205}$$

17) The access code to a house's security system consists of five digits. How many different codes are available if each digit can be repeated?

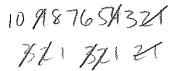$$\overline{10}\ \overline{10}\ \overline{10}\ \overline{10}\ \overline{10} = 10^5 = \boxed{100,000}$$

18) A delivery route must include stops at three cities. If the route is randomly selected, find the probability that the cities will be arranged in alphabetical order. Round your answer to three decimal places.

$$\frac{1}{3} \cdot \frac{1}{2} \cdot \frac{1}{1} = \frac{1}{6} = \boxed{.1667} \qquad \overline{3 \cdot 2 \cdot 1} \quad \frac{1}{6}$$

19) The Environmental Protection Agency must visit nine factories for complaints of air pollution. In how many different ways can a representative visit five of these to investigate this week?

$$_9P_5 = \boxed{15120}$$

20) How many ways can two Republicans, one Democrat, and one Independent be chosen from nine Republicans, five Democrats, and two Independents to fill four positions on city council?

$$_9C_2 \cdot {}_5C_1 \cdot {}_2C_1 = \boxed{360}$$

$$P(2R) \cdot P(1D) \cdot P(1I)$$

4

21) How many different permutations of the letters in the word STATISTICS are there?

$$10\ 9\ 8\ 7\ 6\ 5\ 4\ 3\ 2\ 1$$
$$3\ 2\ 1\ \ 3\ 2\ 1\ \ 2\ 1$$

$$\frac{10!}{(3!\ 3!\ 2!)} = \boxed{50400}$$

22) A student must answer five questions on an exam that contains nine questions.

a) How many ways can the student do this? $_9C_5 = 126$
b) How many ways are there if the student must answer the first and last question? $_7C_3 = 35$

23) In the California State lottery, you must select six numbers from fifty-two numbers to win the big prize. The numbers do not have to be in a particular order. What is the probability that you will win the big prize if you buy one ticket?
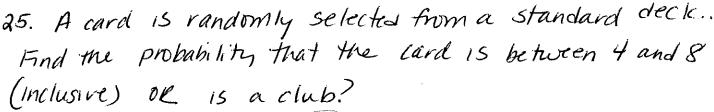
$$\frac{1}{_{52}C_6} \quad \text{or} \quad \frac{1}{52} \cdot \frac{1}{51} \cdot \frac{1}{50} \cdot \frac{1}{49} \cdot \frac{1}{48} \cdot \frac{1}{47} = \frac{1}{263358520}$$

24) In California, each automobile license plate consists of a single digit followed by three letters, followed by three digits. How many distinct license plates can be formed if the first number cannot be zero and the three letters cannot form "GOD"?

24. A random sample of 250 working adults found that 37% access the internet at work, 44% access internet at home and 21% access the internet at both work and home. What is the probability that a person in this sample selected at random access the internet at home OR at work?

$$P(H) + P(W) - P($$
$$.37 + .44 - .21$$

$$P(H) + P(W) - P(H\cup))$$
$$.37 + .44 - .21 = .6 \quad \text{or} \quad \boxed{60\%}$$

$$\frac{92}{250} + \frac{110}{250} - \frac{53}{250} \quad \frac{149}{250}$$

5

25. A card is randomly selected from a standard deck...
Find the probability that the card is between 4 and 8
(inclusive) or is a club?

$$\frac{20}{52} + \frac{13}{52} - \frac{5}{52} = \boxed{\frac{20}{52}}$$

26. Until recently, with the advent of cell phones, modems,
10   and pagers the area codes in the U.S. and Canada
followed a certain system. The first could not be a 0 or 1,
the second could only be 0 or 1, the third number
could not be zero. How many area codes were possible?

$$\overline{8\ \ 2\ \ 9} \qquad\qquad \boxed{144}$$

27. A security code consists of three letters followed by
a digit. The first letter can not be an A, B, C. What
is the probability of guessing the security code on
the first trial?

$$\frac{1}{23}\frac{1}{26}\frac{1}{26} \cdot \frac{1}{10} \quad \frac{1}{155480} = \boxed{.0000064}$$

28. An employer has 13 candidates for 2 positions that
are available to hire. How many ways can the employer
choose these two new hires? $\boxed{78}$

29. Fifteen cyclists enter a race. In how many ways
can they place first, second, or third? $\boxed{2730}$