



3. A shipment of 70 hand-held digital planners, including eight that are defective, is sent to a large electronics store.
- A. If one planner is selected, what is the probability that it is defective?
  
  - B. If five planners are selected, what is the probability that all five are defective?
  
  - C. If five planners are selected, what is the probability that exactly three are defective?
  
  - D. If the original shipment of 70 hand-held digital planners, with 8 defective were representative of a larger batch of 4000 planners, how many planners would you expect to be defective in this larger batch of 4000?
4. The odds of Americans living in the state in which they were born are 24 to 7. What is the probability that an American lives in the state in which he or she was born?
5. The probability that a person wins a certain game is  $\frac{11}{32}$ , what are the odds that the person wins the game?

6. College students (245 students total) were given three choices of pizza toppings and asked to choose one favorite. The following table shows the results.

| Toppings    | Freshman<br>F | Sophomore<br>So | Junior<br>J | Senior<br>S |
|-------------|---------------|-----------------|-------------|-------------|
| Cheese<br>C | 15            | 13              | 24          | 26          |
| Meat<br>M   | 27            | 26              | 13          | 15          |
| Veggie<br>V | 18            | 15              | 27          | 26          |

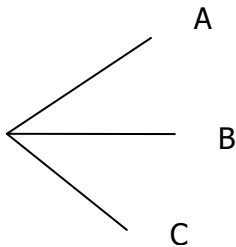
What is the probability that the person selected

- A. is a freshman **or** chooses veggie as their favorite topping:  $P(F \cup V)$
- B. chooses veggie as their favorite topping:  $P(V)$
- C. is a freshman **and** chooses cheese as their favorite topping:  $P(F \cap C)$
- D. chooses **neither** Cheese **nor** veggie as their favorite topping:  $P(C' \cap V')$  or  $P((C \cup V)')$
- E. is a freshman **given that** the person chooses veggie as their favorite topping:  $P(F|V)$
- F. choose veggie as their favorite topping **given that** the person is a freshman:  $P(V|F)$

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7) A store sells three brands of CD players. Forty percents of the CD players they sell are manufactured by Amex, 50% are made by Bates and the remainder are made by Circo. The store has found that 5% of the CD players made by Amex are defective, 4% of the Bates CD players are defective, and 20% of the Circo CD players are defective.

A. Draw a tree diagram with the given information. It is partially outlined for you.



- B. If it is **known that** a CD player is supplied by the Circo company, what is probability that the CD Player is not defective?
- C. What is the probability that a CD player at the store comes from the Bates company?
- D. What is the probability that a CD player is both made by Bates **and** is defective?
- E. What is the probability that a CD player is defective?
- F. If it is **known that** a CD player is defective, what is the probability that it came from the Bates company?

8) FIND THE INTERSECTION POINT OF TWO LINES BY THE ELIMINATION METHOD:  
Solve the following system of equations by Elimination Method.

$$\begin{aligned} 3x + 9y &= 45 \\ 2x + y &= 10 \end{aligned}$$

9) FIND THE INTERSECTION POINT OF TWO LINES BY THE SUBSTITUTION METHOD:  
Solve the following system of equations.

$$\begin{aligned} 3x + 9y &= 45 \\ 2x + y &= 10 \end{aligned}$$

10) Use these matrices to answer the following questions.

$$\begin{aligned} A &= \begin{bmatrix} 4 & -3 & 7 \\ 5 & 0 & -8 \end{bmatrix} & B &= \begin{bmatrix} -3 & 5 \\ 0 & -8 \end{bmatrix} & C &= [4 \quad -3 \quad 7] & D &= \begin{bmatrix} 5 & -2 & 9 \\ 3 & 0 & -6 \\ 4 & -1 & -2 \end{bmatrix} \\ E &= \begin{bmatrix} a & b \\ c & d \\ e & f \end{bmatrix} & F &= \begin{bmatrix} 4 & -3 \\ 5 & 0 \\ 9 & 2 \\ 7 & -8 \end{bmatrix} & G &= \begin{bmatrix} w & x \\ y & z \end{bmatrix} & H &= \begin{bmatrix} 4 \\ -3 \\ 0 \end{bmatrix} \end{aligned}$$

A. List the size of each of the following matrices:

A = \_\_\_\_\_ B = \_\_\_\_\_ C = \_\_\_\_\_ D = \_\_\_\_\_

E = \_\_\_\_\_ F = \_\_\_\_\_ G = \_\_\_\_\_ H = \_\_\_\_\_

B. Do not compute – just answer question!! Are the following products possible to compute? **If so, write yes in the blank. If not, explain why not – be brief – but specific!**

AD \_\_\_\_\_ EF \_\_\_\_\_

FD \_\_\_\_\_ FG \_\_\_\_\_

- C. Find the product  $BG$ .
- D. Find 3 times matrix  $B$ , namely:  $3B$
- E. Find matrix  $B$  added to matrix  $G$ , namely  $B + G$
- F. Find the inverse of matrix  $B$ , namely,  $B^{-1}$
- G. Find matrix  $G$  being subtracted from matrix  $B$ , namely  $B - G$ .

11) A grain dealer sold to one customer 5 bushels of wheat, 2 of corn, and 3 of rye, for \$ 31.00. To another customer he sold 2 bushels of wheat, 3 of corn, and 5 of rye, for \$ 27.60. To a third customer he sold 3 bushels of wheat, 5 of corn, and 2 of rye for \$ 32.70. What was the price per bushel for each of the different grains?

Set up matrix equations for this problem and use inverses to solve.

Let  $x$  represent the price per bushel for wheat,  
 $y$  the price per bushel for corn, and  
 $z$  the price per bushel for rye.

Write the matrix algebra system for this problem:

Use inverses to solve the system

Write out the solution to the problem.

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12) The following probabilities have been determined from a recent survey. The probability that a person favors the current president is 0.72. The probability that a person is male and favors the current president is 0.45. The probability that a person is female and does not favor the current president is 0.21.

A. Draw a Venn diagram that displays the survey results.

Use the diagram to determine the following:

B. a person does not favor the current president

C. a person is male or favors the current president

D. a person is not male or does not favor the current president

E. a person is male and does not favor the current president

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13. Convert the following odds to probabilities:

A. 56 to 95

B. 7 to 13

C. 40 to 11

D. 19 to 3

14. Convert the following probabilities to odds:

A.  $\frac{3}{5}$

B.  $\frac{19}{34}$

C. 0.123

D. 0.87

15. If the odds of winning a game are 9 to 7, what is the probability of losing the game?



16. 1800 people were surveyed. The following table contains data about their favorite colors.

|                     | <b>B</b><br>BLUE | <b>R</b><br>RED | <b>G</b><br>GREEN | <b>Y</b><br>YELLOW | <b>Pu</b><br>PURPLE | <b>Pi</b><br>PINK | <b>O</b><br>ORANGE | TOTALS |
|---------------------|------------------|-----------------|-------------------|--------------------|---------------------|-------------------|--------------------|--------|
| WOMEN ( <b>M'</b> ) | 80               | 170             | 80                | 20                 | 250                 | 350               | 30                 | 980    |
| MEN ( <b>M</b> )    | 450              | 100             | 120               | 10                 | 5                   | 5                 | 130                | 820    |
| TOTALS              | 530              | 270             | 200               | 30                 | 255                 | 355               | 160                | 1800   |

Use the table to calculate the following probabilities.

- A. The probability that a person selected at random from this group is a man **and** their favorite color is green.  **$P(\mathbf{M} \cap \mathbf{G})$**
- B. The probability that a person selected is a woman **or** favorite color is red.  **$P(\mathbf{M}' \cup \mathbf{R})$**
- C. The probability that a person selected at random is a woman **given that** favorite color is purple.  **$P(\mathbf{M}' | \mathbf{Pu})$**
- D. The probability that person selected at random has favorite color of red, **given that** the person is a man.  **$P(\mathbf{R} | \mathbf{M})$**
- E. The probability that a person selected at random from this group is a man **and** their favorite color is not purple.  **$P(\mathbf{M} \cap \mathbf{Pu}')$**

| Blood Type | Male | Female | TOTAL |
|------------|------|--------|-------|
| O          | 80   | 370    | 450   |
| A          | 150  | 250    | 400   |
| B          | 50   | 50     | 100   |
| AB         | 20   | 30     | 50    |
| TOTAL      | 300  | 700    | 1,000 |

17. Use the table to find the probability that a person is selected at random from the group  
*Note: Key words have bold type!!*

- A. has blood type B?
  
  
  
  
  
  
  
  
  
  
- B. is female **and** has blood type B?
  
  
  
  
  
  
  
  
  
  
- C. has blood type B **given that** the person is female?
  
  
  
  
  
  
  
  
  
  
- D. is female **given that** the person has blood type B?
  
  
  
  
  
  
  
  
  
  
- E. the person is female **or** has blood type B?