Time Frame: 50 minutes

Subject Matter: The Addition Rules of Probability

**TELL ME**

Anticipatory Set:

Three cable channels (6, 8, and 10) have quiz shows, comedies, and dramas. The number of each is shown here.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type of Show | Channel 6 | Channel 8 | Channel 10 | Total |
| Quiz Show | 5 | 2 | 1 |   |
| Comedy | 3 | 2 | 8 |   |
| Drama | 4 | 4 | 2 |   |
| Total |   |   |   |   |

If a show is selected at random, find these probabilities.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Event | Mutually Exclusive or Not | Rule | Solution | Answer |
| The show is a quiz show or it is shown on channel 8. |  |  |  |  |
| The show is a drama or a comedy. |  |  |  |  |
| The show is shown in channel 10 or it is a drama. |  |  |  |  |
| The show is shown in channel 10 or channel 8. |  |  |  |  |
| The show is a quiz show, comedy, or drama. |  |  |  |  |

Objective: TSWBAT find the probability of an event using the addition rules for probability.

Standards: DA – 1.1, 1.2, & 1.5

Materials: Textbook, O.H.P. & Transparencies

**SHOW ME**

Presentation of Information:

Definition of Terms:

* **Addition Rule # 1**

When two events A and B are mutually exclusive, the probability that A **or** B will occur is

***P(A or B) = P(A) + P(B)***

* **Addition Rule # 2**

When two events A and B are not mutually exclusive, then

***P(A or B) = P(A) + P(B) – P(A and B)***

**Example 1:** A local postal carrier distributes first-class letters, advertisements, or magazines. For a certain day, she distributed the following numbers of each type of item.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Delivered to | First-class Letters | Advertisements | Magazines | Total |
| Home | 325 | 406 | 203 |   |
| Business | 732 | 1021 | 97 |   |
| Total |   |   |   |   |

If an item of mail is selected at random, find these probabilities:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Event | Mutually Exclusive or Not | Rule | Solution | Answer |
| The item went to a home. |  |  |  |  |
| The item was an advertisement or it went to a business. |  |  |  |  |
| The item was a first-class letter or it went to a home. |  |  |  |  |
| The employee is married or not married. |  |  |  |  |
| The item went to a business or a home. |  |  |  |  |
| The item is a magazine or it went to a business. |  |  |  |  |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**LET ME TRY**

1. The frequency distribution shown here illustrates the number of medical tests conducted on 30 randomly selected emergency patients.

|  |  |
| --- | --- |
| Number of tests performed | Number of patients |
| 0 | 12 |
| 1 | 8 |
| 2 | 2 |
| 3 | 3 |
| 4 or more | 5 |

 If one patient is selected at random, find the probability that it is

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Event | Mutually Exclusive or Not | Rule | Solution | Answer |
| The patient has had exactly 2 tests done. |  |  |  |  |
| The patient has had at least 2 tests done. |  |  |  |  |
| The patient has had at most 3 tests done. |  |  |  |  |
| The patient has had 3 or fewer tests done. |  |  |  |  |
| The patient has had 1 or 2 tests done. |  |  |  |  |
| The patient has had 0 or 2 tests done. |  |  |  |  |

1. The distribution represents the length of time a patient spends in the hospital.

|  |  |
| --- | --- |
| Days | Frequency |
| 0 to 3 | 2 |
| 4 to 7 | 15 |
| 8 to 11 | 8 |
| 12 to 15 | 6 |
| 16 or more | 9 |

 If a patient is selected at random, find these probabilities.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Event | Mutually Exclusive or Not | Rule | Solution | Answer |
| The patient spends 3 days or fewer in the hospital. |  |  |  |  |
| The patient spends fewer than 8 days in the hospital. |  |  |  |  |
| The patient spends 16 days or more days in the hospital. |  |  |  |  |
| The patient spends a maximum of 11 days in the hospital. |  |  |  |  |

Homework:

A sales representative who visits customers at home finds she sells 0, 1, 2, 3, or 4 items according to the following frequency distribution.

|  |  |
| --- | --- |
| Items sold | Frequency |
| 0 | 8 |
| 1 | 10 |
| 2 | 3 |
| 3 | 2 |
| 4 | 1 |

Find the probability that she sells the following.

1. Exactly one item.
2. More than 2 items.
3. At least 1 item.
4. At most 3 items
5. At most 1 item