**4.7** If you roll a die 40 times and 9 of the rolls result in a “5,” what empirical probability was observed for the event “5”?

**4.10** Webster Aquatic Center offers various levels of swimming lessons year-round. The March 2005 Monday and Wednesday evening lessons included instructions from Water Babies through Adults. The number in each classification is given in the table that follows.

**Swim Lesson Types No. Participants**

Water Babies 15

Tiny Tots 12

Tadpoles 12

Level 2 15

Level 3 10

Level 4 6

Level 5 2

Level 6 1

Adults 4

Total 77

1. If one participant is in Tiny Tots.
2. The participant is in the Adults lesson.

**c.** The participant is in a Level 2 to Level 6 lesson.

**4.16** A single die is rolled. What is the probability that the number on top is the following:

**a.** A 3.

**b.** An odd number.

**c.** A number less than 5

**d.** A number no greater than 3

**4.28** Union officials report that 60% of the workers at a large factory belong to the union, 90% make more than $12 an hour, and 40% belong to the union and make more than $12 per hour. Edo you believe these percentages? Explain. Solve using Venn Diagram.

**4.31 a.** Explain what is meant by the statement: “When single die is rolled, the probability of a 1 is ”.

An ordinary die has six equal sides, to the theoretical probability of even A is P(A) =

**b**. Explain what is meant by the statement: “When one coin is tossed one time, there is a 50-50 chance of getting a tail”.

A coin has two sides, there is a 1 in 2 chance of getting tails.

**4.44** The NCAA men’s basketball season starts with 327 college teams all dreaming of making it to “the big dance” and attaining the National Championship. Sixty-four teams are selected for the tournament, and only one wins it all.

**a.** What are the odds against a team being selected for the tournament?

64/327 = 0.196

**b.** What are the odds of a team that is in the tournament winning the National Championship?

1 out of 64

**c.** Now wait a minute! What assumption did you make in order to answer parts a and b? Does this seem realistic?

**4.49** Three hundred viewers were asked if they were satisfied with TV coverage of a recent disaster.

**Gender**

**Female Male**

**Satisfied 80 55**

**Not Satisfied 120 45**

One viewer is to be randomly selected from those surveyed.

1. Find P (satisfied): 135/300 = 0.45
2. Find P (satisfied/female): 80/300 = 0.267
3. Find P (satisfied/male): 55/300 = 0.183

**4.52** During the month of August in 2002, the faculty and staff at Boise State University were asked to participate in a survey to identify the general level of satisfaction with the newlymodified work-week in the summer. The following table lists how 620 respondents answered the question: “How satisfied are you with the Boise State University Summer 2002 Schedule?”

**Neither**

**Very Somewhat Satisfied Nor Somewhat Very**

**Group Satisfied Satisfied Dissatisfied Dissatisfied Dissatisfied Total**

**Faculty 65 24 21 13 9 132**

**Classified 190 61 16 15 2 284**

**staff**

**Professional 139 38 7 12 8 204**

**staff**

**All respondents 394 123 44 40 19 620**

Find the probability of the following for a randomly selected respondent.

1. Was “somewhat satisfied” with the summer 2002 schedule
2. Was a member of the “professional staff”
3. Was “very satisfied’ with the summer 2002 schedule given the respondent was a faculty member
4. Was a member of the “classified staff” given that the respondent was “very dissatisfied” with the summer 2002 schedule

**4.58 a.** If the probability that you pass the next exam in statistics in accurately assessed at 0.75, what is the probability that you will not pass the next statistics exam?

b. The weather forecaster predicts that there is a “70 percent” chance of less than 1 inch of rain during the next 30-day period. What is the probability of at least 1 inch of rain in the next 30 days?

**4.62** If P(A) = 0.5, P(B) = 0.3, and P(A and B) = 0.2, find P(A or B).

**4.64** If (P(A) = 0.4, P(A or B) = 0.9, and P(A and B) = 0.1, find P(B).

**4.79** Suppose that A and B are events defined on a common sample space and tat the following probabilities are known: P(A) = 0.3, P(B) = 0.4, and P(A/B) = 0.2. Find P(A or B).

**4.89** Explain why P(A and B) = 0 when events A and B are mutually exclusive.

**4.104** A and B are independent events, and P(A) = 0.5 and P(B) = 0.8. Find P(A and B).