

EXAMPLE 3 Find odds

AVOID ERRORS

Note that the odds in favor of drawing a 10, which are $\frac{1}{12}$, do not equal the probability of drawing a 10, which is $\frac{4}{52} = \frac{1}{13}$.

A card is drawn from a standard deck of 52 cards. Find (a) the odds in favor of drawing a 10 and (b) the odds *against* drawing a club.

Solution

- a. Odds in favor of drawing a 10 = $\frac{\text{Number of tens}}{\text{Number of non-tens}} = \frac{4}{48} = \frac{1}{12}$, or 1 : 12
- b. Odds against drawing a club = $\frac{\text{Number of non-clubs}}{\text{Number of clubs}} = \frac{39}{13} = \frac{3}{1}$, or 3 : 1

EXPERIMENTAL PROBABILITY Sometimes it is not possible or convenient to find the theoretical probability of an event. In such cases, you may be able to calculate an *experimental probability* by performing an experiment, conducting a survey, or looking at the history of the event.

KEY CONCEPT

For Your Notebook

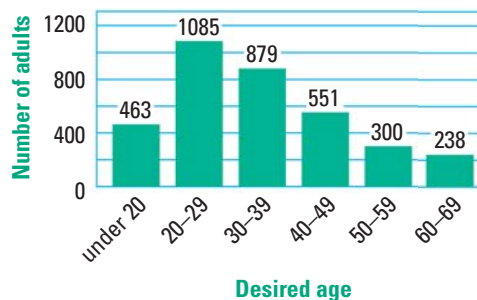
Experimental Probability of an Event

When an experiment is performed that consists of a certain number of trials, the **experimental probability** of an event A is given by:

$$P(A) = \frac{\text{Number of trials where } A \text{ occurs}}{\text{Total number of trials}}$$

EXAMPLE 4 Find an experimental probability

SURVEY The bar graph shows how old adults in a survey would choose to be if they could choose any age. Find the experimental probability that a randomly selected adult would prefer to be at least 40 years old.



Solution

The total number of people surveyed is:

$$463 + 1085 + 879 + 551 + 300 + 238 = 3516$$

Of those surveyed, $551 + 300 + 238 = 1089$ would prefer to be at least 40.

$$P(\text{at least 40 years old}) = \frac{1089}{3516} \approx 0.310$$



GUIDED PRACTICE for Examples 3 and 4

A card is randomly drawn from a standard deck. Find the indicated odds.

4. In favor of drawing a heart
5. Against drawing a queen
6. **WHAT IF?** In Example 4, what is the experimental probability that an adult would prefer to be (a) at most 39 years old and (b) at least 30 years old?