Solution

Because the cards are being drawn with replacement, the first card drawn has no effect on the next card drawn, and so on. So the events are independent, and we can use the Multiplication Rule for Independent Events.

Let A be the event "draw a diamond," B the event "draw a black card," and C the event "draw a ten." Recall that a standard deck of 52 cards contains 13 diamonds, 26 black cards, and 4 tens. So, $P(A)=\frac{13}{52}, P(B)=\frac{26}{52},$ and $P(C)=\frac{4}{52}.$

Then, applying the Multiplication Rule for independent events, the probability that the first card drawn will be a diamond, the second card a black card, and the third card a ten is

$$P(A)\cdot P(B)\cdot P(C)=\frac{13}{52}\cdot\frac{26}{52}\cdot\frac{4}{52}=\frac{1}{104}\approx 0.009615$$

10.R.1 Exercises

Concept Check

True/False. Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

1. In $\frac{11}{13}$, the denominator is 11.

2. $\frac{17}{0}$ is undefined.

3. To find $\frac{1}{2}$ of $\frac{2}{9}$ requires multiplication.

4. The statement $\frac{1}{3}\cdot\frac{2}{5}=\frac{2}{5}\cdot\frac{1}{3}$ is an example of the associative property of multiplication.

Practice

Raise each fraction to higher terms as indicated.

5. $\frac{1}{7} = \frac{?}{35}$

6. $\frac{3}{5} = \frac{?}{60}$

Reduce each fraction to lowest terms.

7. $\frac{5}{23}$

8. $\frac{29}{39}$

Simplify and reduce to lowest terms.

9. $\frac{7}{3} \cdot \frac{1}{8}$

10. $\frac{7}{15} \cdot \frac{3}{8}$

11. $\frac{48}{7} \div \frac{48}{27}$

12. $\frac{11}{10} \div \frac{27}{26}$

Applications

Solve.

13. A bus is carrying 90 passengers, which is $\frac{9}{10}$ of the capacity of the bus. What is the capacity of the bus?

14. There are 3000 students at Canyon High School and $\frac{1}{4}$ of these students are seniors. If $\frac{3}{5}$ of the seniors are opposed to the school forming a rock climbing team and $\frac{9}{10}$ of the remaining students (not seniors) are also opposed to forming a rock climbing team, how many students are in favor of this idea?

Writing & Thinking

15. If two fractions are between 0 and 1, can their product be more than 1? Explain.