

B FINDING PROBABILITIES Find the indicated probability. State whether A and B are disjoint events.

28. $P(A) = 0.25$
 $P(B) = 0.4$
 $P(A \text{ or } B) = 0.50$
 $P(A \text{ and } B) = \underline{\quad? \quad}$
0.15; not disjoint

29. $P(A) = 0.6$
 $P(B) = 0.32$
 $P(A \text{ or } B) = \underline{\quad? \quad}$
 $P(A \text{ and } B) = 0.25$
0.67; not disjoint

30. $P(A) = \underline{\quad? \quad}$
 $P(B) = 0.38$
 $P(A \text{ or } B) = 0.65$
 $P(A \text{ and } B) = 0$
0.27; disjoint

31. $P(A) = \frac{8}{15}$
 $P(B) = \underline{\quad? \quad}$

32. $P(A) = \frac{1}{2}$
 $P(B) = \frac{1}{6}$

33. $P(A) = 16\%$
 $P(B) = \underline{\quad? \quad}$

$P(A \text{ or } B) = \frac{3}{5}$

$P(A \text{ or } B) = \frac{2}{3}$

$P(A \text{ or } B) = 32\%$

$P(A \text{ and } B) = \frac{2}{15}$
 $\frac{1}{5}$; not disjoint

$P(A \text{ and } B) = \underline{\quad? \quad}$
0; disjoint

$P(A \text{ and } B) = 8\%$
24%; not disjoint

34. **★ OPEN-ENDED MATH** Describe a real-life situation that involves two disjoint events A and B . Then describe a real-life situation that involves two overlapping events C and D .

ROLLING DICE Two six-sided dice are rolled. Find the probability of the given event. (Refer to Example 4 on page 709 for the possible outcomes.)

35. The sum is 3 or 4. $\frac{5}{36}$

36. The sum is not 7. $\frac{5}{6}$

37. The sum is greater than or equal to 5. $\frac{5}{6}$

38. The sum is less than 8 or greater than 11. $\frac{11}{18}$

39. **★ MULTIPLE CHOICE** Two six-sided dice are rolled. What is the probability that the sum is a prime number? **C**

(A) $\frac{13}{36}$

(B) $\frac{7}{18}$

(C) $\frac{5}{12}$

(D) $\frac{5}{11}$

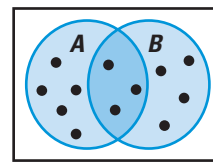
- C** 40. **★ SHORT RESPONSE** Use the first diagram at the right to explain why this equation is true:

$$P(A) + P(B) = P(A \text{ or } B) + P(A \text{ and } B)$$

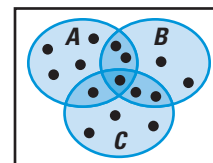
See margin.

41. **CHALLENGE** Use the second diagram at the right to derive a formula for $P(A \text{ or } B \text{ or } C)$.

$$P(A \text{ or } B \text{ or } C) = P(A) + P(B) + P(C) - P(A \text{ and } B) - P(B \text{ and } C) - P(A \text{ and } C) + P(A \text{ and } B \text{ and } C)$$



Ex. 40



Ex. 41

PROBLEM SOLVING

EXAMPLES **A**
1, 2, and 3
 on pp. 707–708
 for Exs. 42–44

42. **CLASS ELECTIONS** You and your best friend are among several candidates running for class president. You estimate that there is a 45% chance you will win and a 25% chance your best friend will win. What is the probability that either you or your best friend win the election? **70%**

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43. **BIOLOGY** You are performing an experiment to determine how well plants grow under different light sources. Out of the 30 plants in the experiment, 12 receive visible light, 15 receive ultraviolet light, and 6 receive both visible and ultraviolet light. What is the probability that a plant in the experiment receives either visible light or ultraviolet light? **0.7**

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