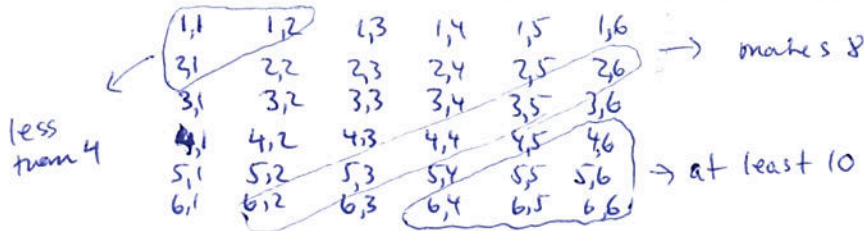


1. Roll 2 standard six sided number cubes. Write the sample space.



2. What is the probability of rolling an 8?

$$P(\text{rolling } 8) = \frac{5}{36}$$

3. What is the probability of rolling a 7?

$$P(\text{rolling } 7) = \frac{6}{36} = \frac{1}{6}$$

4. What is the probability of rolling at least a 10?

At least 10 means greater than or equal to $\therefore P(\text{at least } 10) = \frac{6}{36} = \frac{1}{6}$

5. What is the probability of rolling a number less than 4?

$$P(\text{less than } 4) = \frac{3}{36} = \frac{1}{12}$$

Let A = Roll a 7 or more

Let B = Roll a 1 or 2 on the first die.

6. $P(A) = \frac{21}{36} = \frac{7}{12}$

7. $P(B) = \frac{12}{36} = \frac{1}{3}$

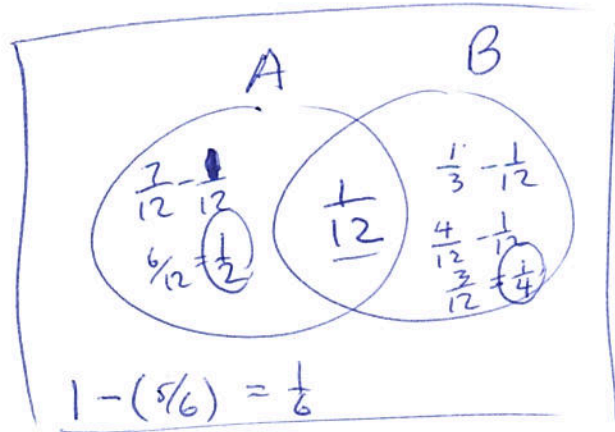
8. $P(A^c) = 1 - P(A)$
 $= 1 - \frac{7}{12}$
 $= \frac{5}{12}$

9. $P(B^c) = 1 - P(B)$
 $= 1 - \frac{1}{3}$
 $= \frac{2}{3}$

10. $P(A \cap B) = \frac{3}{36} = \frac{1}{12}$

11. $P(A \cup B) = \frac{1}{2} + \frac{1}{4} + \frac{1}{12} = \frac{6}{12} + \frac{3}{12} + \frac{1}{12} = \frac{10}{12} = \frac{5}{6}$

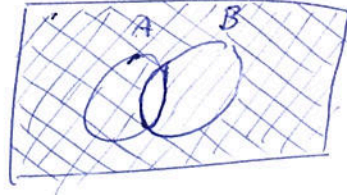
$\frac{1}{2} \cdot \frac{6}{6} + \frac{1 \cdot 3}{4 \cdot 3} + \frac{1}{12}$



For the following, it may be helpful to draw a Venn diagram and shade each part.

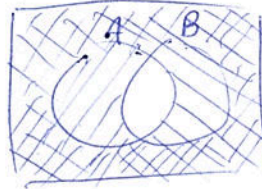
12. $P(A^c \cup B^c) =$

$$1 - P(A \cap B) = 1 - \frac{1}{12} = \frac{11}{12}$$

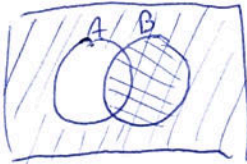


13. $P(A^c \cap B^c) = 1 - P(A \cup B)$

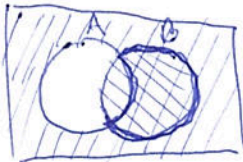
$$= 1 - \frac{5}{6} = \frac{1}{6}$$



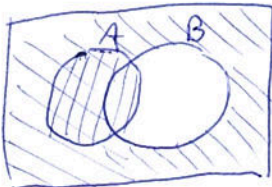
14. $P(A^c \cup B) = 1 - \frac{1}{2} = \frac{1}{2}$



15. $P(A^c \cap B) = \frac{1}{4}$



16. $P(A \cup B^c) = 1 - \frac{1}{4} = \frac{3}{4}$



17. $P(A \cap B^c) = \frac{1}{2}$

