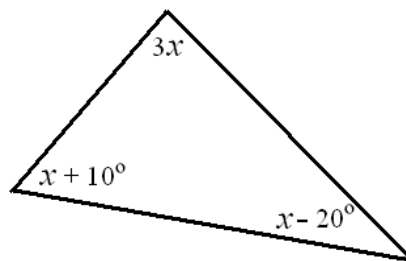


Review Problems

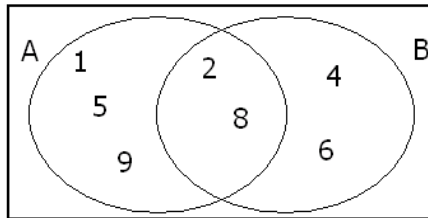
For problems 1-4, let $A = \{1, 2, 5, 8, 9\}$ and $B = \{2, 4, 6, 8\}$.

1. Draw a Venn diagram depicting these sets.
2. Find each of the following.
 - a) $A \cap B$
 - b) $A \cup B$
 - c) $B \cup (A \cap B)$
3. Label each of the following statements as true or false.
 - a) $A \subseteq A \cap B$
 - b) $B \subseteq A \cup B$
 - c) $A \cap B \subseteq A \cup B$
4. Subsets.
 - a) List all two-element subsets of A .
 - b) List all subsets of B .
5. Let P denote the set of all students taking physics at Truman College. Let M denote the set of all students taking mathematics at Truman College.
 - a) describe the set $P \cap M$
 - b) describe the set $P \cup M$
6. We walk into a restaurant. The menu lists 2 different choices for appetizers, 3 different choices for the main entry, and 5 different choices for desserts. How many different 3-entry meals can a guest possibly select? (Assume that a 3-entry meal consists of 1 appetizer, 1 main entry, and 1 dessert.)
7. How many different four digit numbers can be formed from the digits 1, 2, 3, and 4, if repetition is allowed (for example, 1424 is allowed)?
8. How many different four digit numbers can be formed from the digits 1, 2, 3, and 4, if repetition is not allowed (for example, 1424 is not allowed)?
9. We toss a coin and then throw a die. How many different outcomes are possible?
10. Find the value of x based on the picture below.



Answers

1. A Venn diagram depicting these sets:



2. a) $\{2, 8\}$ b) $\{1, 2, 4, 5, 6, 8, 9\}$ c) $\{2, 4, 6, 8\}$

3. a) false b) true c) true

4. a)

$\{1, 2\}$	$\{2, 5\}$	$\{5, 8\}$	$\{8, 9\}$
$\{1, 5\}$	$\{2, 8\}$	$\{5, 9\}$	
$\{1, 8\}$	$\{2, 9\}$		
$\{1, 9\}$			

b)

\emptyset

$\{2\}, \{4\}, \{6\}, \{8\}$

$\{2, 4\}, \{2, 6\}, \{2, 8\}, \{4, 6\}, \{4, 8\}, \{6, 8\}$

$\{2, 4, 6\}, \{2, 4, 8\}, \{2, 6, 8\}, \{4, 6, 8\}$

$\{2, 4, 6, 8\}$

5. a) $P \cap M$ - the set of all students taking mathematics and physics at Truman College.

b) $P \cup M$ - the set of all students taking mathematics or physics or both at Truman College.

6. 30

7. $4 \cdot 4 \cdot 4 \cdot 4 = 4^4 = 256$

8. $4 \cdot 3 \cdot 2 \cdot 1 = 24$

9. 12

10. Solve the equation $(x + 10) + (x - 20) + (3x) = 180$.

$x = 38$