Venn Diagrams

TEKS 8.12.C

A **Venn diagram** uses shapes to show how sets are related.

EXAMPLE **Draw a Venn diagram of the positive integers less than 13 where set *A* consists of factors of 12 and set *B* consists of even numbers.**

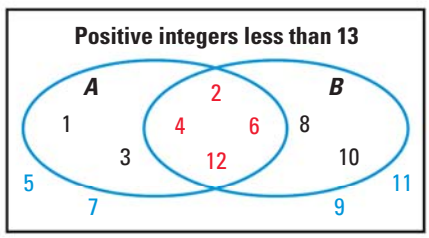
Positive integers less than 13:
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

Set *A* (factors of 12): 1, 2, 3, 4, 6, 12

Set *B* (even numbers): 2, 4, 6, 8, 10, 12

Both set *A* and set *B*: **2**, **4**, **6**, **12**

Neither set *A* nor set *B*: **5**, **7**, **9**, **11**



EXAMPLE **Use the Venn diagram above to decide if the statement is *true* or *false*. Explain your reasoning.**

a. If a positive integer less than 13 is not even, then it is not a factor of 12.

▸ False. 1 and 3 are not even, but they are factors of 12.

b. All positive integers less than 13 that are even are factors of 12.

▸ False. 8 and 10 are even, but they are not factors of 12.

PRACTICE

Draw a Venn diagram of the sets described.

1. Of the positive integers less than 11, set *A* consists of factors of 10 and set *B* consists of odd numbers.
2. Of the positive integers less than 10, set *A* consists of prime numbers and set *B* consists of even numbers.
3. Of the positive integers less than 25, set *A* consists of multiples of 3 and set *B* consists of multiples of 4.

Use the Venn diagrams you drew in Exercises 1–3 to decide if the statement is *true* or *false*. *Explain* your reasoning.

4. The only factors of 10 less than 11 that are not odd are 2 and 10.
5. If a number is neither a multiple of 3 nor a multiple of 4, then it is odd.
6. All prime numbers less than 10 are not even.
7. If a positive odd integer less than 11 is a factor of 10, then it is 5.
8. There are 2 positive integers less than 25 that are both a multiple of 3 and a multiple of 4.
9. If a positive even integer less than 10 is prime, then it is 2.