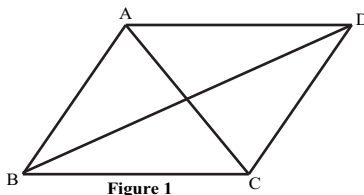# Congruence Worksheet 3- Answers

Figure 1

For questions 1-4, refer to the Figure 1.

1. You want to prove a theorem about the parallelogram $ABCD$. What information are we given?
$\overline{AD}\|\overline{BC}$, $\overline{AB}\|\overline{DC}$.

2. Which theorem can we use to prove that opposite angles of parallelograms are congruent?
Alternate Interior Angles Theorem, Angle Addition Postulate.

3. What allows us to say that $\triangle ABD \cong \triangle CDB$?
ASA Postulate

4. What allows us to say that $\overline{AB} \cong \overline{DC}$ and $\overline{AD} \cong \overline{BC}$?
Corresponding parts of congruent triangles are congruent.

5. In addition to the theorems and definitions already stated, what is necessary to prove that a parallelogram's diagonals bisect each other?
Vertical Angles Theorem (vertical angles are always congruent)

6. If we want to prove that rectangles are parallelograms, what about rectangles must we prove?
Opposite sides of the rectangle are parallel, or $\overline{AD}\|\overline{BC}$ and $\overline{AB}\|\overline{DC}$.

For questions 7-10, use the theorems about parallelograms to prove or disprove the strangers' statements.

7. While walking through the park, a man on a soapbox screams, Nothing you know true! Parallelograms only have 3 sides! Is this man correct?
No. A parallelogram is a quadrilateral. By definition, it has 4 sides.

8. You're at the bowling alley, beating the pants off your friend Jimmy in the third game. Frustrated, he says, All parallelograms are rectangles. Is Jimmy right or just flustered?
He is just flustered. All rectangles are parallelograms, but not all parallelograms are rectangles.

9. You are at the Bingo hall spending time with your grandmother. Her friend Ruth starts complaining how much she hated math class, but there was one thing she would never forget. She said, Parallelograms are made of two congruent triangles. Is Ruth off her rocker?
Nope. Ruth is spot on. In each of our proofs about parallelograms, we've shown that a parallelogram contains two congruent triangles.

10. While playing an online video game, one of your Internet friends claims he learned in class today that the internal angles of parallelograms add up to 270

degrees. Should he put down the controller and hit the math books?

He should hit the books. By definition, a parallelogram is a quadrilateral. All quadrilaterals have internal angles that add up to 360 degrees.

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