Exercise Questions for Parallel Lines (Grade 7 Mathematics)

Lesson 1: Introduction to Parallel Lines

1. Define parallel lines. Provide two real-life examples.
2. Draw two parallel lines using a scale and set square.
3. Explain the properties of a parallelogram.
4. Draw a parallelogram with sides of 4 cm and 6 cm. Label the sides and angles.

Lesson 2: Lines and Angles

1. Draw two intersecting lines. Label the four angles formed as ∠1\angle 1∠1, ∠2\angle 2∠2, ∠3\angle 3∠3, and ∠4\angle 4∠4. Measure each angle.
2. Identify the pairs of vertical angles and adjacent angles.
3. If ∠1\angle 1∠1 is 65°, find the measures of ∠2\angle 2∠2, ∠3\angle 3∠3, and ∠4\angle 4∠4. Explain your reasoning.

Lesson 3: Angles with Parallel Lines

1. Draw two parallel lines and a transversal. Label the eight angles formed.
2. Identify and measure the corresponding angles.
3. Identify and measure the alternate interior angles.
4. Identify and measure the co-interior angles.
5. If one of the corresponding angles is 120°, find the measures of all other angles formed by the transversal.

Lesson 4: Angle Relationships in Parallelograms

1. Draw a parallelogram with one angle labeled as 70°. Calculate the measures of the remaining three angles.
2. Explain why opposite angles in a parallelogram are equal.

3. Draw a parallelogram with sides of 5 cm and 7 cm and one angle of 110°. Calculate the measures of all other angles.

Lesson 5: Corresponding and Alternate Angles

1. Draw two parallel lines and a transversal. Label all the angles formed.
2. Identify and label the corresponding angles.
3. Identify and label the alternate interior angles.
4. If one of the alternate interior angles is 85°, find the measures of the corresponding and other alternate interior angles.
5. Explain why corresponding angles are equal when parallel lines are cut by a transversal.

Lesson 6: Interior and Exterior Angles

1. Draw two parallel lines and a transversal. Label the interior and exterior angles.
2. Measure the interior and exterior angles and verify the sum of co-interior angles is 180°.
3. If one of the interior angles is 130°, calculate the measures of the other interior and exterior angles.
4. Explain the relationship between co-interior angles and why their sum is 180°.

Lesson 7: Sum of Angles in Triangles

1. Draw a triangle and label its interior angles ∠A\angle A∠A, ∠B\angle B∠B, and ∠C\angle C∠C. Measure and find the sum of these angles.
2. Draw a parallel line to one side of the triangle through the opposite vertex. Use this line to verify that the sum of the interior angles of a triangle is 180°.

3. If one angle of a triangle is 50° and the second angle is 60°, find the measure of the third angle.
4. Explain why the sum of the angles in any triangle is always 180°.

Additional Challenging Questions for USS Preparation

1. Given two parallel lines cut by a transversal, if one angle is $2x°$ and its corresponding angle is $(3x - 10)°$, find the value of x.
2. In a parallelogram, if one angle is $(2y + 10)°$ and its adjacent angle is $(4y - 20)°$, find the value of y and the measures of all angles.
3. If the interior angles of a triangle are given by $2z°$, $(3z - 20)°$, and $(4z + 10)°$, find the value of z and the measures of all angles.