Introduction to Trigonometry Homework Sheet

Student Name: _____

Class: _____

Due Date: _____

Introduction and Instructions

Welcome to this introduction to trigonometry homework sheet. In this assignment, you will apply your knowledge of trigonometric ratios to solve problems involving right-angled triangles. The learning objectives for this assignment are to:

- Apply trigonometric ratios (sine, cosine, and tangent) to solve problems involving right-angled triangles
- Identify and use the relationships between the sides and angles of right-angled triangles
- Develop problem-solving skills and critical thinking in the context of trigonometry

To complete this assignment, please follow these steps:

1. Read and understand the instructions and problems carefully.
2. Use a pencil and paper to work out your solutions.
3. Show all your working and explain your reasoning where possible.
4. Use a calculator only to check your final answers.
5. Check your work carefully before submitting your assignment.

Activity 1 - Trigonometric Ratios

Solve the following problems:

1. In a right-angled triangle, the length of the hypotenuse is 10 cm and the length of the side opposite the angle is 6 cm. Find the sine, cosine, and tangent of the angle.

2. A right-angled triangle has a side adjacent to the angle of 8 cm and a hypotenuse of 10 cm. Find the sine, cosine, and tangent of the angle.

3. A right-angled triangle has an angle of 30°, an opposite side of 5 cm, and an adjacent side of 8.66 cm. Find the length of the hypotenuse.

Activity 2 - Word Problems

Solve the following word problems:

1. A ladder of length 5 meters is leaning against a wall, making an angle of 60° with the ground. How far is the base of the ladder from the wall?

2. A surveyor is measuring the height of a building. She measures the angle of elevation to the top of the building to be 45° and the distance from her position to the base of the building to be 20 meters. What is the height of the building?

3. A pilot is flying at an altitude of 1000 meters. The angle of depression to a landmark on the ground is 30°. How far is the pilot from the landmark?

Activity 3 - Mixed Questions

Solve the following mixed questions:

1. In a right-angled triangle, the sine of an angle is 0.6. Find the cosine and tangent of the angle.

2. A right-angled triangle has a hypotenuse of 15 cm and a side opposite the angle of 9 cm. Find the angle.

3. A right-angled triangle has an angle of 45° and a hypotenuse of 10 cm. Find the length of the side opposite the angle.

Extension Activity 1 - Real-World Applications

Research and write a short report on a real-world application of trigonometry, such as:

- Navigation and surveying
- Physics and engineering
- Computer graphics and game development

Extension Activity 2 - Trigonometric Identities

Prove the following trigonometric identities:

1. $\sin^2(x) + \cos^2(x) = 1$

2. $\tan(x) = \sin(x) / \cos(x)$

Conclusion and Self-Assessment

To successfully complete this assignment, you should:

- Show a clear understanding of trigonometric ratios and their relationships
- Apply trigonometric ratios to solve problems involving right-angled triangles
- Use correct mathematical notation and formatting
- Check your work carefully and show all working

Reflect on your learning and self-assess your understanding using the following questions:

- What did I learn about trigonometric ratios?
- What challenges did I face, and how did I overcome them?
- What would I do differently next time?