Wan/Galan
LAHSA - Geometry Spring 2024

How I Solved This

Due Date: Friday, April 12 2024 at 10:41am

Assignment Goal: In this essay, I am going to articulate and explain how I used my mathematical problem-solving skills to solve a geometry problem.

Tasks
Task One: Choose and solve **one** of the problems listed on second page
Task Two: Introduction
In two or three sentences, please state:

a. Your name
b. The class that this assignment is for
c. The problem that you will be solving

Task Three: What Do I Know?
In a paragraph, answer the following:

a. What information is the problem giving you?
b. What does the problem want you to solve?
c. What prior knowledge do you have that will help you solve this problem?

Task Four: What Do I Need to Know?
In a paragraph, answer the following:

a. What information is not given from the problem?
b. What information is needed to find the solution to the problem?

Task Five: How Can I Solve This?
In a paragraph, answer the following:

a. How can your prior mathematical knowledge help you solve this problem?
b. What steps did you use to solve this problem?
c. How do you know that your solution is correct?

Task Six: Reflection
In a paragraph, answer the following:

a. What was most challenging about this assignment?
b. Was any part of this assignment helpful in solving the problem you choose? Why?

You can either type or handwrite this essay. If you type it, please print it out or upload it as a PDF onto Schoology. You can use drawings for any part of this essay, but these must be your **own work** (no internet images).

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Problems: Choose one to write about

a. RFK wants to build a ramp for students that use wheelchairs. They already have two pieces of wood that measure 5 feet and 16 feet. What are the whole-number lengths of the shortest and longest pieces of wood that they could use to complete their triangular ramp?

b. Your friend is designing a triangular logo. He draws a triangle with side lengths of 2.5cm, 4cm, and 6cm. What type of triangle is this?

c. Sheily draws a rectangle with a length of 130 cm and a width of 90cm. She draws a similar rectangle that has a length of 13cm. What is the width of the smaller rectangle?

d. Mr. Addison needs a triangular ramp with a short leg of 8ft and a long leg of 15ft. He knows that this ramp is a right triangle. What is the hypotenuse of the ramp?

e. ABC is a right triangle. Angle C is the right angle. The measurement of angle A is half the measurement of angle B. What are the angle measurements of triangle ABC?

Example:

How I Solved This

Introduction

My name is Ms. Wan, and I am the student teacher for Mr. Galan's Period Four Geometry class. Today, I will be solving the following problem: *NOP is a triangle where all three angles are 5 degrees apart. Angle N is the smallest angle and angle P is the largest. What are the angle measurements for* $\triangle NOP$*?*

What Do I Know?

This problem gave me a triangle with vertices N, O, and P. Angle N is the angle with the smallest measurement, and angle P is the angle with the largest measurement. The measurements for these angles are five degrees apart. This problem wants me to find the measurements for all three angles: Angle N, Angle P, and Angle O. I learned about the Triangle Angle Sum Theorem, which states that the three interior angles of a triangle must add up to 180°. This theorem will help me find the angle measurements of $\triangle NOP$.

What Do I Need to Know?

This problem does not given me the measurements for any of the angles of $\triangle NOP$. I also am not given any side lengths. This problem does not tell me whether this triangle is right, acute, or obtuse. However, the only information that I need is the measurements of the interior angles.

How Can I Solve This?

I can use the Triangle Angle Sum Theorem to help me solve this problem. Since Angle N, Angle O, and Angle P must add up to 180°, I can write the equation:

$$\text{Angle N} + \text{Angle O} + \text{Angle P} = 180°$$

Since the angle measurements are five degrees apart, and Angle N is the smallest, I can find Angle O by adding five degrees to Angle N, and I can find Angle P by adding five degrees to Angle O.

$$\text{Angle N} + 5 = \text{Angle O}$$

$$\text{Angle O} + 5 = \text{Angle P}$$

Now, my new equation using the Triangle Angle Sum Theorem is:

$$\text{Angle N} + (\text{Angle N} + 5) + (\text{Angle O} + 5) = 180°$$

I can't solve this equation just yet because I have two unknowns: Angle N and Angle O. However, I can substitute the equation Angle N + 5 for Angle O. Now my equation is:

$$\text{Angle N} + (\text{Angle N} + 5) + ((\text{Angle N} + 5) + 5) = 180°$$

Now, I can combine like terms. Three Angle Ns are equal to Angle N times 3, and three 5s are equal to 5 times three. I am going to also replace Angle N with the variable, *n*. Now my equation is:

$$3n + 3(5) = 180°$$

$$3n + 15 = 180°$$

To solve for *n*, I need to get all the other terms to the opposite side of *n*. I can do this by subtracting 15 from both sides of the equation, then dividing by 3:

$$3n + 15 - 15 = 180° - 15$$

$$3n = 165$$

$$\frac{3n}{3} = \frac{165}{3}$$

$$n = 55$$

Because *n* equals 55, Angle N is 55 degrees. I can add 5 degrees to Angle N to get Angle O. 55 + 5 is 60, so Angle O is 60 degrees. I can add 5 degrees to Angle O to get Angle P. 60 + 5 is 65, so Angle P is 65 degrees. I know my answer is correct because Angle N, Angle O, and Angle P all add up to 180 degrees.

$$55 + 60 + 65 = 180$$

Reflection

The hardest part of this assignment was writing the equation to solve this problem. It took me a while to figure out that I could substitute Angle O and Angle P by adding 5 and 10 degrees, respectively, to Angle N. This assignment was helpful for solving the problem that I chose because the problem gave a lot of information. Restating this information in an essay helped me organize this information.