

Task 1: Textual Reasoning

Question:

Given that

$$\tan \beta = \frac{1}{2}$$

where β is an angle, determine the exact value of the following expression:

$$\sin^2 \beta - 3 \sin \beta \cos \beta + 4 \cos^2 \beta$$

Answers from Other Models



Show-o, Emu3 and Janus Pro 7B do not support this task.

Answer from MMaDA

<think>

To find the value of $(\sin^2 \beta - 3 \sin \beta \cos \beta + 4 \cos^2 \beta)$ given that $\tan \beta = 1/2$, we can follow these steps:

1. **Express $\sin \beta$ and $\cos \beta$:**

$$\sin \beta = \tan \beta / \sqrt{1 + \tan^2 \beta} = (1/2) / \sqrt{1 + (1/2)^2} = 1/\sqrt{5}$$
$$\cos \beta = 1 / \sqrt{1 + \tan^2 \beta} = 2/\sqrt{5}$$

2. **Calculate each term:**

$$\sin^2 \beta = (1/\sqrt{5})^2 = 1/5$$
$$3 \sin \beta \cos \beta = 3 \cdot (1/\sqrt{5}) \cdot (2/\sqrt{5}) = 3 \cdot (2/5) = 6/5$$
$$4 \cos^2 \beta = 4 \cdot (2/\sqrt{5})^2 = 4 \cdot (4/5) = 16/5$$

3. **Substitute and simplify:**

$$\sin^2 \beta - 3 \sin \beta \cos \beta + 4 \cos^2 \beta = 1/5 - 6/5 + 16/5 = 11/5$$

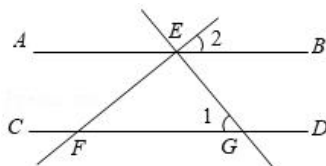
Final Answer: **11/5**

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The exact value is 11/5.



Task 2: Multimodal Reasoning



Question:

In the diagram provided, lines AB and CD are parallel. The line EF intersects AB at point E and CD at point F. From point E, a perpendicular EG is drawn to EF, meeting CD at point G. Given that angle 1 is 52 degrees, what is the measure of angle 2?

Answers from Other Models

Show-o:

Angle 2 measures **52 degrees**.

Emu3:

Angle 2 is equal to angle 1 due to the parallel lines AB and CD. Since angle 1 measures 52 degrees, angle 2 also measures **52 degrees**.

Janus Pro 7B:

Since line AB is parallel to line CD, corresponding angles are equal. Therefore, angle 1 and angle 2 are equal.

Since angle 1 measures 52 degrees, angle 2 also measures 52 degrees.

The answer is: **52**



Answer from MMaDA

<think>

To determine the measure of angle 2, we need to analyze the given information and use the properties of parallel lines and perpendicularity.

1. **Identify the given information:**

- Line AB is parallel to line CD.
- Points E and F are the intersections of line EF with lines AB and CD respectively.
- Line EG is perpendicular to line EF, with point E as the foot of the perpendicular.
- Line EG intersects line CD at point G.
- Angle 1 measures 52 degrees.

2. **Understand the relationship between the angles:**

- Since EG is perpendicular to EF, angle FEG is 90 degrees.
- Therefore, angle 2 + angle 1 = 90 degrees.

3. **Determine the measure of angle 2:**

- Angle 2 = 90 degrees - 52 degrees = 38 degrees.

So, the measure of angle 2 is **38**.

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The measure of angle 2 is 38 degrees.



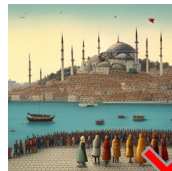
Task 3: World Knowledge-Aware Text-to-Image Generation

Prompt:

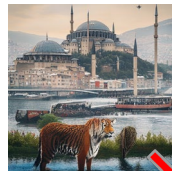
The most popular kind of animal among the people of Istanbul.

Images from Other Models

Show-o



Emu3



Janus Pro 7B



CoT and Image from MMaDA

<think>

The description states that the most popular animal among the people of Istanbul is the cat. This is because cats are a popular animal for companionship and people in the city.

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A close-up of a cat with a light brown and white fur pattern.

