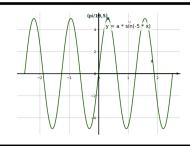# Synthesis

Input Image

- **Question**: What is the function's equation?
- **Original Answer**: Step 1: Substitute the point $(\frac{\pi}{10}, 5)$ into the function: $5 = a \cdot \sin(-5 \cdot \frac{\pi}{10})$. Step 2: Simplify the equation: $5 = a \cdot \sin(\frac{-\pi}{2})$. Step 3: Since $\sin(\frac{-\pi}{2}) = -1$, we have: $5 = -a$. Step 4: Solve for a : $a = -5$. Step 5: Substitute the value of a back into the original function: $y = -5 \cdot \sin(-5 \cdot x)$. Answer: $y = -5 \cdot \sin(-5 \cdot x)$.

VL-Thinking

🤔

<think>
First, I recognize that the function given is $y = a \cdot \sin(-5x)$, and it passes through the point $\left(\frac{\pi}{10}, 5\right)$.

To find the value of a, I'll substitute the coordinates of the point into the equation.

Substituting $x = \frac{\pi}{10}$ and $y = 5$, the equation becomes:
$5 = a \cdot \sin\left(-5 \cdot \frac{\pi}{10}\right)$

Simplifying the argument of the sine function:
$-5 \cdot \frac{\pi}{10} = -\frac{\pi}{2}$

So, the equation now is:
$5 = a \cdot \sin\left(-\frac{\pi}{2}\right)$

I know that $\sin\left(-\frac{\pi}{2}\right) = -1$, so substituting this value in:
$5 = a \cdot (-1)$

Solving for a:
$5 = a \cdot (-1)$

Finally, substituting $a = -5$ back into the original function gives:
$y = -5 \cdot \sin(-5x)$
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To determine the equation of the function $y = a \cdot \sin(-5x)$ that passes through the point $\left(\frac{\pi}{10}, 5\right)$, follow these steps:

1. **Substitute the Point into the Equation**:
   Plug $x = \frac{\pi}{10}$ and $y = 5$ into the equation:
   $5 = a \cdot \sin\left(-5 \cdot \frac{\pi}{10}\right)$

2. **Simplify the Argument of the Sine Function**:
   $-5 \cdot \frac{\pi}{10} = -\frac{\pi}{2}$
   So, the equation becomes:
   $5 = a \cdot \sin\left(-\frac{\pi}{2}\right)$

3. **Evaluate the Sine Function**:
   $\sin\left(-\frac{\pi}{2}\right) = -1$
   Substituting this back into the equation:
   $5 = a \cdot (-1)$

4. **Solve for a:**
   $a = -5$

5. **Write the Final Equation**:
   Substitute $a = -5$ back into the original function:
   $y = -5 \cdot \sin(-5x)$

6. **Simplify the Negative Sign (Optional)**:
   Since $\sin(-\theta) = -\sin(\theta)$, the equation can also be written as:
   $y = 5 \cdot \sin(5x)$

Final Answer:
$y = -5\sin(-5x)$