

User Input: Can you solve the following math problem? Peter has twice as many socks as Jack and half times as many dishes as Jack. Jack collected twice as many dishes as socks in the store. If Jack collected 60 dishes, calculate the total number of socks and dishes they have together? Explain your reasoning. Your final answer should be a single numerical number, in the form `\boxed{answer}`, at the end of your response.

Round 1

Agent 1: If Jack collected twice as many dishes as socks, then he collected $60/2 = 30$ socks.

Peter has half times as many dishes as Jack, meaning he has $60/2 = 30$ dishes.

If Peter has twice as many socks as Jack, then he has $2*30 = 60$ socks.

Together, Peter and Jack have $60+30+30 = 120$ socks and dishes. Answer: `\boxed{120}`.



Agent 2: If Jack has collected twice as many dishes as socks and he collected 60 dishes, then he has $60/2 = 30$ socks.

Peter has twice as many socks as Jack, which means he has $2*30 = 60$ socks.

Peter also has half as many dishes as Jack, which means he has $60/2 = 30$ dishes.

The total number of dishes and socks they have together is $60+30+30 = 120$.



User Input: These are the solutions to the problem from other agents: One agent solution:

(Copy Agent 2's reply)

(Copy Agent 1's reply)

Using the solutions from other agents as additional information, can you provide your answer to the math problem? Please update and respond to other agents. Your final answer should be a single numerical number, in the form `\boxed{answer}`, at the end of your response.

Round 2

Agent 1: I agree with the solutions provided by the other agents.

If Jack collected 60 dishes and he collected twice as many dishes as socks, then he collected $60/2 = 30$ socks.

If Peter has twice as many socks as Jack, then he has $2*30 = 60$ socks.

If Peter has half as many dishes as Jack, then he has $60/2 = 30$ dishes.

Therefore, the total number of dishes and socks they have together is $60+30+30 = 120$.



Agent 2: I agree with the solutions provided by the other agents. The total number of socks and dishes they have together is 120. Therefore, my answer is `\boxed{120}`.



User Input: These are the solutions to the problem from other agents: One agent solution:

(Copy Agent 2's reply)

(Copy Agent 1's reply)

Using the solutions from other agents as additional information, can you provide your answer to the math problem? Please update and respond to other agents. Your final answer should be a single numerical number, in the form `\boxed{answer}`, at the end of your response.

Round 3

Agent 1: I agree with the solutions provided by the other agents.

If Jack collected 60 dishes and he collected twice as many dishes as socks, then he collected $60/2 = 30$ socks.

If Peter has twice as many socks as Jack, then he has $2*30 = 60$ socks.

If Peter has half as many dishes as Jack, then he has $60/2 = 30$ dishes.

Therefore, the total number of dishes and socks they have together is $60+30+30 = 120$.



Agent 2: I agree with the solutions provided by the other agents. Therefore, the total number of socks and dishes they have together is 120. My final answer is `\boxed{120}`.



Figure 23: Example of Incorrect GSM8K Debate.

Instruction: What is the result of $4+23*6+24-24*12$? Make sure to state your answer at the end of the response.

Round 1

Agent 1: The result of $4+23*6+24-24*12$ is -244.



Agent 2: Using the order of operations (PEMDAS), we will first multiply 23 by 6 to get 138. Then we will multiply 24 by 12 to get 288. Finally, we will add up all the terms: $4 + 138 + 24 - 288 = -122$.



Instruction: These are the recent/updated opinions from other agents: (Copy Agent 2's reply) Use these opinions carefully as additional advice, can you provide an updated answer? Make sure to state your answer at the end of the response.

Instruction: These are the recent/updated opinions from other agents: (Copy Agent 1's reply) Use these opinions carefully as additional advice, can you provide an updated answer? Make sure to state your answer at the end of the response.

Round 2

Agent 1: Based on the order of operations (PEMDAS), the correct way to solve the expression $4 + 23*6 + 24 - 24*12$ is:

$$4 + 138 + 24 - 288 = -122$$

Therefore, the updated answer is -122.



Agent 2: One common way to accurately solve mathematical expressions is by using the order of operations (PEMDAS) which means Parentheses, Exponents, Multiplication and Division, and finally Addition and Subtraction from left to right. To apply this rule in solving the given mathematical expression, we will first multiply 23 by 6 then multiply 24 by 12 before performing any addition or subtraction. Using PEMDAS,

$$4 + 23*6 + 24 - 24*12 = 4 + 138 + 24 - 288 = -122.$$

Therefore, based on the order of operations, the result of the expression is -122, contrary to the opinion provided by another agent.



Instruction: These are the recent/updated opinions from other agents: (Copy Agent 2's reply) Use these opinions carefully as additional advice, can you provide an updated answer? Make sure to state your answer at the end of the response.

Instruction: These are the recent/updated opinions from other agents: (Copy Agent 1's reply) Use these opinions carefully as additional advice, can you provide an updated answer? Make sure to state your answer at the end of the response.

Round 3

Agent 1: I agree with the analysis and solution provided by the other agent. Using the order of operations (PEMDAS), we perform multiplication before addition or subtraction. Therefore the expression is calculated as follows:

$$4 + 23*6 + 24 - 24*12 = 4 + 138 + 24 - 288 = -122$$

So, the updated answer is -122.



Agent 2: Yes, I agree with the other agents that based on the order of operations (PEMDAS), the correct way to solve the expression $4 + 23*6 + 24 - 24*12$ is:

$$4 + 138 + 24 - 288 = -122$$

Therefore, the updated answer is -122.



Figure 24: Example of Arithmetic Debate.

Instruction: What is the result of $4+23*6+24-24*12$? Make sure to state your answer at the end of the response.







Round 1	
<p>Agent 1: The result of $4+23*6+24-24*12$ is -244.</p> <p></p> <p>Instruction: These are the recent/updated opinions from other agents: (Copy Agent 2's reply) Use these opinions carefully as additional advice, can you provide an updated answer? Make sure to state your answer at the end of the response.</p>	<p>Agent 2: Using the order of operations (PEMDAS), we will first multiply 23 by 6 to get 138. Then we will multiply 24 by 12 to get 288. Finally, we will add up all the terms: $4 + 138 + 24 - 288 = -122$.</p> <p></p> <p>Instruction: These are the recent/updated opinions from other agents: (Copy Agent 1's reply) Use these opinions carefully as additional advice, can you provide an updated answer? Make sure to state your answer at the end of the response.</p>
Round 2	
<p>Agent 1: Based on the order of operations (PEMDAS), the correct way to solve the expression $4 + 23*6 + 24 - 24*12$ is:</p> $4 + 138 + 24 - 288 = -122$ <p>Therefore, the updated answer is -122.</p> <p></p> <p>Instruction: These are the recent/updated opinions from other agents: (Copy Agent 2's reply) Use these opinions carefully as additional advice, can you provide an updated answer? Make sure to state your answer at the end of the response.</p>	<p>Agent 2: One common way to accurately solve mathematical expressions is by using the order of operations (PEMDAS) which means Parentheses, Exponents, Multiplication and Division, and finally Addition and Subtraction from left to right. To apply this rule in solving the given mathematical expression, we will first multiply 23 by 6 then multiply 24 by 12 before performing any addition or subtraction. Using PEMDAS,</p> $4 + 23*6 + 24 - 24*12 = 4 + 138 + 24 - 288 = -122.$ <p>Therefore, based on the order of operations, the result of the expression is -122, contrary to the opinion provided by another agent.</p> <p></p> <p>Instruction: These are the recent/updated opinions from other agents: (Copy Agent 1's reply) Use these opinions carefully as additional advice, can you provide an updated answer? Make sure to state your answer at the end of the response.</p>
Round 3	
<p>Agent 1: I agree with the analysis and solution provided by the other agent. Using the order of operations (PEMDAS), we perform multiplication before addition or subtraction. Therefore the expression is calculated as follows:</p> $4 + 23*6 + 24 - 24*12 = 4 + 138 + 24 - 288 = -122$ <p>So, the updated answer is -122.</p> <p></p>	<p>Agent 2: Yes, I agree with the other agents that based on the order of operations (PEMDAS), the correct way to solve the expression $4 + 23*6 + 24 - 24*12$ is:</p> $4 + 138 + 24 - 288 = -122$ <p>Therefore, the updated answer is -122.</p> <p></p>

Figure 25: **Example of Arithmetic Debate with Summarization.** Four separate agents participate in debate, with two illustrated above. Instruction contains the summarized responses across agents.