

Appendix - *EduDiag*: A Benchmark for Educational Diagnostic Reasoning with Error Tracing and Correction on Large Multimodal Models

1. Benchmark Construction

1.1. Prompt for AI-assisted Annotation

Table 1 defines five types of errors used in annotating erroneous reasoning chains. Table 2 and 3 shows the prompt for annotating erroneous reasoning chains and feedback.

1.2. Annotation GUI

Figure 1 shows the graphical interface used by human annotators to remove sample redundancy. The annotation process is as follows: a set of highly redundant samples is grouped together, and human annotators select one or two of the most representative samples, while the remaining samples are discarded. Figure 2 shows the graphical interface used by human annotators when filtering erroneous reasoning chains. Our evaluation includes a logical accuracy check, representative error identification, and diversity verification. The average pairwise Cohen’s Kappa score between annotators on 100 samples is 0.65.

2. Experimental Details

2.1. Model Details

Table 4 shows the details of the LMMs used in our experiments, including the corresponding LLMs and the visual encoders. All experiments are conducted with eight NVIDIA A100-80GB GPUs. Open-source models are deployed locally using vLLM, utilizing official checkpoints for model serving. We also apply LoRA fine-tuning on the open-source models, with a LoRA rank of 16, a learning rate of $2e-5$, 3 training epochs, a maximum sequence length of 4096, and a batch size of 2. We further fine-tune the Qwen2.5-VL-7B using group relative policy optimization (GRPO). The training is conducted with a LoRA rank of 32, a learning rate of $1e-5$, a maximum sequence length of 4096, and a batch size of 1. To compute reward \mathcal{R}_2 , we employ doubao-1.5-pro-32k to verify whether the final step of the generated erroneous reasoning chain appears among the candidate incorrect answers in the reference set.

Visual Perception Error: These errors arise when there is a failure to accurately interpret the information contained within images or diagrams presented in the question due to visual issues.

Calculation Error: These errors manifest during the calculation process, which may include arithmetic mistakes such as incorrect addition, subtraction, multiplication, or division, errors in unit conversion, or mistakes in the numerical signs between multiple reasoning steps

Reasoning Error: These errors occur during the problem-solving process when improper reasoning is applied, leading to incorrect application of logical relationships or conclusions.

Knowledge Error: These errors result from an incomplete or incorrect understanding of the knowledge base, leading to mistakes when applying relevant knowledge points.

Misinterpretation of the Question: These errors occur when there is a failure to correctly understand the requirements of the question or a misinterpretation of the question’s intent, leading to responses that are irrelevant to the question’s demands.

Table 1. The prompt for the definition of the errors types of erroneous reasoning chains.

2.2. Distractor Generation

To assess if the model can better create more challenging multiple-choice questions after improving its error-tracing abilities. We use the prompt shown in Table 5 to guide the model for distractor generation. First, it generates three potential erroneous reasoning chains and corresponding distractors from the question, reference correct solution.

3. More Cases

More cases of generated erroneous reasoning chains and corresponding feedback from different domains are shown in Fig. 3~7.

ID: physical-commonsense-1385



Question: What can be inferred about the building in the picture?

- Option A: It is a popular tourist attraction.
- Option B: It is currently under construction.
- Option C: It is located in a high-crime area.
- Option D: It is an abandoned or unused building.

Candidate Chains:

1	2	3	4	5
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Preview Group

Next Group

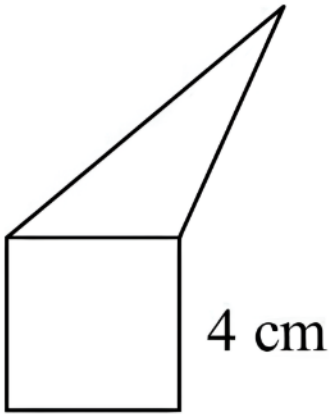
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Jump

Select The Best

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Figure 1. The graphical interface for human annotators to remove redundant samples.



Question: In the diagram, a square with sides of length 4cm and a triangle with the same perimeter as the square are joined together to form a pentagon. What is the perimeter of the pentagon?

Rationale:

Step1: Determine the perimeter of the square. Since the square has a perimeter of 16 cm, each side of the square is $16 \text{ cm} / 4 = 4 \text{ cm}$.
 Step2: Recognize that the triangle shares one side with the square, which is 4 cm long.
 Step3: Calculate the total perimeter of the square and triangle combined without considering the shared side. This is 2 times the perimeter of the square, which is $2 * 16 \text{ cm} = 32 \text{ cm}$.
 Step4: Subtract the length of the shared side twice because it is counted in both the square and the triangle. The length of the shared side is 4 cm, so we subtract $2 * 4 \text{ cm} = 8 \text{ cm}$.
 Step5: Calculate the final perimeter of the pentagon by subtracting the double-counted shared side from the combined perimeter of the square and triangle.

Error Chain 1:

Step1: Determine the perimeter of the square. Since the square has a perimeter of 16 cm, each side of the square is $16 \text{ cm} / 4 = 4 \text{ cm}$.
 Step2: Assume the triangle's perimeter is equal to the square's perimeter, which is 16 cm.

Logical Accuracy Check: Representative Error Identification: Diversity Verification:

Error Chain 2:

Preview

Next

Enter index

Jump

Save

current index: 1

Figure 2. The graphical interface for human annotators to select the erroneous reasoning chains from a candidate set.

You will generate five incorrect reasoning chains based on the question, answer, rationale (i.e., correct reasoning chain),distractors from the original question derive the incorrect answers as distractors, provid the error type of the distractor.The error type can be Visual Perception Errors,Calculation Error,Reasoning Error, Knowledge Error (Lack of Knowledge). These incorrect reasoning chains are to come from each of the following five error types.

Visual Perception Error: These errors arise when there is a failure to accurately interpret the information contained within images or diagrams presented in the question due to visual issues.

Calculation Error: These errors manifest during the calculation process, which may include arithmetic mistakes such as incorrect addition, subtraction, multiplication, or division, errors in unit conversion, or mistakes in the numerical signs between multiple steps

Reasoning Error: These errors occur during the problem-solving process when improper reasoning is applied, leading to incorrect application of logical relationships or conclusions.

Knowledge Error: These errors result from incomplete or incorrect understanding of the knowledge base, leading to mistakes when applying relevant knowledge points.

Misinterpretation of the Question: These errors occur when there is a failure to correctly understand the requirements of the question or a misinterpretation of the question’s intent, leading to responses that are irrelevant to the question’s demands.

- Each step must include detailed solution steps and calculations, not just a brief description.
- Erroneous reasoning chain (Error COT) means that there should be errors in the wrong reasoning link, which is the reasoning process of a student thinking about the distractor.
- Avoid contradictions where the reasoning chain is correct but the distractor is wrong; the reasoning chain and the distractor should both be incorrect.
- Explicitly identify errors in the reasoning process.
- Multiple distractors should be different from each other; avoid having all three distractors be the same.
- Distractor should be similar to the number of words and format of the answer.
- Format your final answer as a JSON. You need to strictly follow the json format.

The output format should be:

...

Next is the input question, answer, rationale from the original question, you need to analyze.

Table 2. The prompt for annotating erroneous reasoning chains.

You will generate feedback based on the question, answer, rationale, and erroneous reasoning chains. Feedback consists of two parts: explanation and principle

- The explanation should include which step is incorrect, why the distractor is incorrect, how to correct the error towards the answer, and improvements starting from the incorrect reasoning chain).Wrap the answer with `\\boxed{}`
- The principle should be a general rule that can be applied to similar problems to prevent similar mistakes.
- Format your final answer as a JSON. You need to strictly follow the json format.

The output format should be:

...

Next is the input question, answer, rationale and erroneous reasoning chain from the original question, you need to analyze.

Table 3. The prompt for annotating feedback.

LMMs	LLM (Size)	Vision Encoder
<i>Open-Source Models</i>		
DeepSeek-VL-7B	DeepSeek (7B)	SigLip@384px
GLM-4.1V-9B-Thinking	GLM4 (9B)	Aimv2-Huge@224px
LLaVA-OneVision-7B	Qwen2 (7B)	SigLip-SO400M/14@384px
InternVL3-2B	Qwen2.5 (1.5B)	InternViT-300M@448px
InternVL3-9B	Internlm3 (8B)	InternViT-300M@448px
InternVL3-14B	Qwen2.5 (14B)	InternViT-300M@448px
Qwen2.5-VL-3B	Qwen2.5 (3B)	ViT-bigG
Qwen2.5-VL-7B	Qwen2.5 (7B)	ViT-bigG
Qwen2.5-VL-72B	Qwen2 (72B)	ViT-bigG
Qwen3-VL-4B	Qwen3 (4B)	SigLIP2-Large-300M
Qwen3-VL-8B	Qwen3 (8B)	SigLIP2-SO-400M
R1-Onevision-7B	Qwen2.5 (7B)	ViT-bigG
Llama-3.2-11B	Llama-3 (8B)	ViT-H/14
Llama-3.2-90B	Llama-3 (70B)	ViT-H/14
Llama-3.2V-11B-COT	Llama-3 (8B)	ViT-H/14
MiniCPM-V-2.6	Qwen2 (7B)	SigLip-400M
MiniCPM-o-2.6	Qwen2.5 (7B)	SigLip-400M
<i>Proprietary Models</i>		
Gemini-2.0-Flash	N / A	N / A
Gemini-2.5-Pro	N / A	N / A
Claude-3.5-Sonnet	N / A	N / A
GPT-4o-mini	N / A	N / A
GPT-4o	N / A	N / A
GPT-5	N / A	N / A

Table 4. The details of the models used in our experiments.

You are an expert in proficient education. Given an image, a question, a correct answer, and a rationale, you need to generate three different possible erroneous reasoning chains and corresponding three different plausible distractors. Next is the input question, answer, and rationale from the original question that you need to analyze.

Distractors are not allowed to be the same as each other, and they are not allowed to be the same as the answer, but the format of distractor should be similar to the answer.

[question]

[answer]

[correct chain of thought]

The output format should be:

...

Table 5. The prompt for distractor generation.



Question:What is happening at this location?

Answer: A restaurant is preparing food

Rationale:Step1: Identify the presence of people wearing chef hats and a man in a chef uniform preparing food; Step2: Recognize that these elements suggest a restaurant setting; Step3: Observe the animal carcasses hanging from the ceiling, indicating that the restaurant is preparing meat dishes; Step4: Note the presence of a microwave on the shelf, which further reinforces the idea that this is a kitchen setting; Step5: Conclude that the correct answer is 'A restaurant is preparing food.'

Incorrect Answer:A butcher shop is preparing meat

GT:

Erroneous Chain: [Step1]: Identify the presence of people wearing chef hats and a man in a chef uniform preparing food; [Step2]: Notice the animal carcasses and reason they are for a butcher shop; [Step3]: Conclude that the location is a butcher shop preparing meat.,

Explanation: The error occurs in Step 2, where the presence of a chef and kitchen equipment is overlooked, leading to the incorrect assumption of a butcher shop. Correct the error by considering the full context, including the presence of cooking equipment like a microwave, which is more typical of a restaurant. Therefore, the answer is `{A restaurant is preparing food}`.

Principle:Consider all visual elements in context to avoid misinterpretation of the setting.

InternVL3-8B:

Erroneous Chain:[Step1]: Identify the presence of people wearing chef hats and a man in a chef uniform preparing food; [Step2]: Recognize that these elements suggest a restaurant setting; [Step3]: Observe the animal carcasses hanging from the ceiling, indicating that the restaurant is preparing meat dishes; **[Step4]: Note the presence of a microwave on the shelf, which further reinforces the idea that this is a kitchen setting; Step5: Conclude that the correct answer is 'A butcher shop is preparing meat.,**

Explanation: The error occurs in Step5, where the conclusion is incorrect. The presence of a chef and a restaurant setting suggests a restaurant, not a butcher shop. Therefore, the answer is `{A restaurant is preparing food}`.

Principle: Differentiate between similar settings by considering the roles and typical environments associated with them.

Figure 3. An example in social commonsense.



Question: What is the purpose of the gold rooster on top of the tower with a clock?

Answer: To indicate the direction of the wind

Rationale: [Step1]: Observe the gold rooster standing at the top of the tower; [Step2]: Notice the cross arrow under the gold rooster; [Step3]: Understand that the combination of the gold rooster and the cross arrow serves as a weather vane; [Step4]: Conclude that the purpose of the weather vane is to indicate the direction of the wind; [Step5]: Therefore, the correct answer is 'To indicate the direction of the wind'.

Incorrect Answer: To protect the tower from lightning strikes

GT:

Erroneous Chain: [Step1]: Observe the gold rooster standing at the top of the tower; [Step2]: Notice the height and position of the rooster; [Step3]: Assume that the purpose of the gold rooster is to act as a lightning rod; [Step4]: Conclude that the purpose of the gold rooster is to protect the tower from lightning strikes.

Explanation: The error occurs in Step 3, where the assumption is made that the rooster acts as a lightning rod. While height is a factor for lightning rods, the presence of the cross arrow indicates a weather vane. Verify the purpose of structures by examining all components and their typical uses. Therefore, the answer is \boxed{To indicate the direction of the wind}.

Principle: Evaluate the intended function of structural elements by considering both their form and the context of their components.

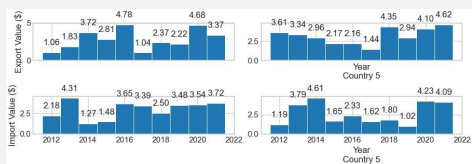
Llama-3.2-11B:

Erroneous Chain: [Step1]: Observe the gold rooster standing at the top of the tower; [Step2]: Notice the cross arrow under the gold rooster; [Step3]: Misinterpret the combination of the gold rooster and the cross arrow as a time-telling mechanism; [Step4]: Conclude that the purpose of the gold rooster is to tell the time.

Feedback: The error occurs in Step3. The gold rooster and the cross arrow are actually a weather vane, not a time-telling mechanism. Correcting the error involves recognizing the function of a weather vane. Therefore, the answer is \boxed{To indicate the direction of the wind}.

Principle: Base conclusions on visible evidence and avoid assumptions without supporting cues.

Figure 4. An example in social commonsense.



Question: Can you provide the balances of trade figures for Country 5 and Country 1 in 2013?

Answer: \$-0.45 Trillion, \$-2.48 Trillion

Rationale: [Step 1]: Find all raw data for the year 2013, which includes the export and import values for both Country 5 and Country 1. The data is as follows: |Year|Country|Export Value (\$)|Import Value (\$)| |----|:----|:----|:----| |2013|Country 1|1.83 Trillion|4.31 Trillion| |2013|Country 5|3.34 Trillion|3.79 Trillion|; [Step 2]: Extract the Export Value and Import Value for both Country 5 and Country 1 from the data: |Year|Country|Export Value (\$)|Import Value (\$)| |----|:----|:----|:----| |2013|Country 5|3.34 Trillion|3.79 Trillion| |2013|Country 1|1.83 Trillion|4.31 Trillion|; [Step 3]: Identify the specific Export and Import Values for each country: - Country 5 has an Export Value of \$3.34 Trillion and an Import Value of \$3.79 Trillion in 2013. - Country 1 has an Export Value of \$1.83 Trillion and an Import Value of \$4.31 Trillion in 2013; [Step 4]: Calculate the trade balances by subtracting the Import Value from the Export Value for each country. - For Country 5, the trade balance is \$3.34 trillion - \$3.79 trillion = \$-0.45 trillion. - For Country 1, the trade balance is \$1.83 trillion - \$4.31 trillion = \$-2.48 trillion; [Step 5]: Summarize the trade balances: Country 5's trade balance in 2013 was approximately \$-0.45 Trillion, while Country 1's trade balance for the same year was approximately \$-2.48 Trillion; [Step 6]: Therefore, the correct answer is '\$-0.45 Trillion, \$-2.48 Trillion'.

Incorrect Answer: \$0.45 Trillion, \$2.48 Trillion

GT:

Erroneous Chain: [Step1]: Find all raw data for the year 2013, which includes the export and import values for both Country 5 and Country 1. The data is as follows: |Year|Country|Export Value (\$)|Import Value (\$)| |----|:----|:----|:----| |2013|Country 1|1.83 Trillion|4.31 Trillion| |2013|Country 5|3.34 Trillion|3.79 Trillion|; [Step2]: Extract the Export Value and Import Value for both Country 5 and Country 1 from the data: |Year|Country|Export Value (\$)|Import Value (\$)| |----|:----|:----|:----| |2013|Country 5|3.34 Trillion|3.79 Trillion| |2013|Country 1|1.83 Trillion|4.31 Trillion|; [Step3]: Identify the specific Export and Import Values for each country: - Country 5 has an Export Value of \$3.34 Trillion and an Import Value of \$3.79 Trillion in 2013. - Country 1 has an Export Value of \$1.83 Trillion and an Import Value of \$4.31 Trillion in 2013; [Step4]: Calculate the trade balances by subtracting the Export Value from the Import Value for each country. - For Country 5, the trade balance is \$3.79 trillion - \$3.34 trillion = \$0.45 trillion. - For Country 1, the trade balance is \$4.31 trillion - \$1.83 trillion = \$2.48 trillion.; [Step5]: Summarize the trade balances: Country 5's trade balance in 2013 was approximately \$0.45 Trillion, while Country 1's trade balance for the same year was approximately \$2.48 Trillion; [Step6]: Therefore, the incorrect answer is '\$0.45 Trillion, \$2.48 Trillion'.

Explanation: The error occurs in Step 4, where the calculation of the trade balance is reversed. The trade balance should be calculated by subtracting the Import Value from the Export Value, not the other way around. Correct the calculation to find the correct trade balances: for Country 5, \$3.34 trillion - \$3.79 trillion = \$-0.45 trillion, and for Country 1, \$1.83 trillion - \$4.31 trillion = \$-2.48 trillion. Therefore, the answer is $\boxed{\$-0.45 \text{ Trillion}, \$-2.48 \text{ Trillion}}$.

Principle: Always subtract the Import Value from the Export Value to calculate the trade balance, ensuring the correct order of operations.

DeepSeek-VL-7B:

Erroneous Chain: [Step1]: Find all raw data for the year 2013, which includes the export and import values for both Country 5 and Country 1. The data is as follows: |Year|Country|Export Value (\$)|Import Value (\$)| |----|:----|:----|:----| |2013|Country 1|1.83 Trillion|4.31 Trillion| |2013|Country 5|3.34 Trillion|3.79 Trillion|; [Step2]: Extract the Export Value and Import Value for both Country 5 and Country 1 from the data: |Year|Country|Export Value (\$)|Import Value (\$)| |----|:----|:----|:----| |2013|Country 5|3.34 Trillion|3.79 Trillion| |2013|Country 1|1.83 Trillion|4.31 Trillion|; [Step3]: Identify the specific Export and Import Values for each country: - Country 5 has an Export Value of \$3.34 Trillion and an Import Value of \$3.79 Trillion in 2013. - Country 1 has an Export Value of \$1.83 Trillion and an Import Value of \$4.31 Trillion in 2013; [Step4]: Calculate the trade balances by adding the Import Value to the Export Value for each country. - For Country 5, the trade balance is \$3.34 trillion + \$3.79 trillion = \$0.45 trillion. - For Country 1, the trade balance is \$1.83 trillion + \$4.31 trillion = \$2.48 trillion; [Step5]: Summarize the trade balances: Country 5's trade balance in 2013 was approximately \$0.45 Trillion, while Country 1's trade balance for the same year was approximately \$2.48 Trillion; [Step6]: Therefore, the incorrect answer is '\$0.45 Trillion, \$2.48 Trillion'.

Feedback: The error occurs in Step 4, where the Import Value is added to the Export Value instead of subtracted. To correct this, subtract the Import Value from the Export Value for each country: - For Country 5, \$3.34 trillion - \$3.79 trillion = \$-0.45 trillion. - For Country 1, \$1.83 trillion - \$4.31 trillion = \$-2.48 trillion. Therefore, the answer is $\boxed{\$-0.45 \text{ Trillion}, \$-2.48 \text{ Trillion}}$.

Principle: Always subtract the Import Value from the Export Value to calculate trade balances.

Figure 5. An example in social science.

Month	Precipitation (mm)	Temperature (°C)	Area
1	355.4	26.9	Area A
2	478.3	26.4	Area A
3	281.7	30.4	Area A
4	270.4	26.1	Area A
5	258.5	28.0	Area A
6	175.1	24.8	Area A
7	249.4	27.0	Area A
8	237.7	24.8	Area A
9	248.2	28.3	Area A
10	264.6	23.5	Area A
11	272.7	27.7	Area A
12	256.9	22.9	Area A

Question: Can you describe the climate shown in the picture?

Answer: Tropical rainforest climate

Rationale: [Step 1]: Our initial step involves scrutinizing the temperature distribution illustrated in the figure for a full year. The temperature remains consistently warm year-round, consistently exceeding 20 degrees Celsius; [Step 2]: Our next step is to assess the annual precipitation distribution as illustrated in the figure. Annual precipitation levels consistently surpass 200mm, ensuring ample rainfall throughout the year; [Step 3]: Drawing from our earlier analysis, let's condense the key rules concerning temperature and precipitation: The weather remains consistently warm and rainy throughout the entire year; [Step 4]: Thus, you can expect a climate of tropical rainforest climate in this context; [Step 5]: As a result, the answer is tropical rainforest climate.

Incorrect Answer: monsoon climate

GT:

Erroneous Chain: [Step1]: Analyze the temperature distribution. The temperature is consistently warm, above 20 degrees Celsius; [Step2]: Review the precipitation distribution. Notice that the precipitation is above 200mm for most months; [Step3]: The climate is similar to a monsoon climate due to high rainfall; [Step4]: Therefore, the climate is a monsoon climate.

Explanation: The error occurs in Step 3, where the assumption of a monsoon climate is made without considering the lack of a distinct dry season. Correcting this involves understanding that a monsoon climate typically has a pronounced dry season, which is absent here. Therefore, the answer is $\boxed{\text{tropical rainforest climate}}$.

Principle: Ensure all climate characteristics are consistently met before concluding the climate type.

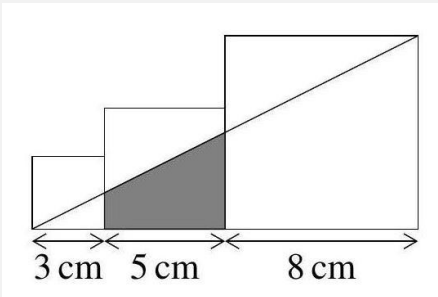
InternVL2-8B:

Erroneous Chain: [Step1]: Examine the temperature distribution. The temperature exceeds 20 degrees Celsius for most months; [Step2]: Assess the precipitation. Precipitation is high, but not consistently above 200mm; [Step3]: **Conclude that the climate is monsoon climate due to high precipitation.**

Feedback: The error occurs in Step 2, where the precipitation is misinterpreted. Correct the error by accurately assessing the precipitation data, which consistently exceeds 200mm. Therefore, the answer is $\boxed{\text{tropical rainforest climate}}$.

Principle: Ensure accurate data interpretation by cross-referencing with reliable sources and verifying numerical data.

Figure 6. An example in natural science.



Question: The diagram shows three squares of side-length 3cm,5cm and 8cm. What is the area, in cm^2 , of the shaded trapezium?

Answer: $55/4cm^2$

Rationale: [Step1]: Let the lengths of the vertical sides of the shaded trapezium be p and q ; [Step2]: Using similar triangles, set up the proportion for p : $p/3=8/(3+5+8)$; [Step3]: Solve for p : $p = 3/2$; [Step4]: Set up the proportion for q : $q/(3+5)= 8/(3+5+8)$.; [Step5]: Solve for q : ($q = 4$); [Step6]: Calculate the area of the trapezium using the formula $1/2 \times (q + p) \times \text{height}$; [Step7]: Substitute the values into the formula: $(1/2 \times (3/2 + 4) \times 5)$; [Step8]: Simplify the expression: $(1/2 \times 11/2 \times 5)$; [Step9]: Calculate the final area: $55/4$; [Step10]: The final answer is $(55/4 cm^2)$.

Incorrect Answer: $35/4 cm^2$

GT:

Erroneous Chain: [Step1]: Let the lengths of the vertical sides of the shaded trapezium be p and q ; [Step2]: Using similar triangles, set up the proportion for p : $p/3=8/(3+5+8)$; [Step3]: Solve for p : $p = 3/2$; [Step4]: Set up the proportion for q : $q/(3+5)= 8/(3+5+8)$; [Step5]: Solve for q : $q = 4$; [Step6]: Calculate the area of the trapezium using the formula $1/2 \times (q + p) \times \text{height}$; [Step7]: Substitute the values into the formula $(1/2 \times (3/2 + 4) \times 5)$; [Step8]: Simplify the expression: $(1/2 \times 7/2 \times 5)$; [Step9]: Calculate the final area: $35/4cm^2$.

Explanation: The error occurs in Step 8 where $(p + q)$ is incorrectly calculated as $7/2$ instead of $11/2$. This leads to an incorrect area calculation. To correct this, carefully add the fractions $3/2$ and 4 to get $11/2$. Recalculate the area with the correct sum to arrive at the correct answer. Therefore, the answer is $\boxed{55/4cm^2}$.

Principle: Double-check arithmetic operations, especially when working with fractions, to avoid errors in intermediate steps.

Qwen3-VL-8B :

Erroneous Chain: [Step1]: Let the lengths of the vertical sides of the shaded trapezium be p and q ; [Step2]: Using similar triangles, set up the proportion for p : $p/3=8/(3+5+8)$; [Step3]: Solve for p : $p = 3/2$; [Step4]: Set up the proportion for q : $q/(3+5)= 8/(3+5+8)$; [Step5]: Solve for q : $q = 4$; [Step6]: Calculate the area of the trapezium using the formula $1/2 \times (q + p) \times \text{height}$; [Step7]: Substitute the values into the formula: $(1/2 \times (3/2 + 4) \times 5)$; **[Step8]: Simplify the expression: $1/2 \times 11/2 \times 5$; [Step9]: calculate the final area: $35/4$; [Step10]: The final (incorrect) answer is $35/4cm^2$.**

Explanation: The error occurs in Step9, where the final calculation of the area is incorrect. The correct calculation should be: $(1/2 \times 11/2 \times 5)$. Therefore, the answer is $\boxed{55/4cm^2}$.

Principle: Ensure accurate data interpretation by cross-referencing with reliable sources and verifying numerical data.

Figure 7. An example in geometry.