

Sect. 1.5 Proofs that are not Valid

There are several types of errors to look for in proofs. Four errors include:

#1: Proofs that begin with a false statement.

“All high school students like Facebook. Rebecca is a high school student. Therefore, Rebecca likes Facebook.” *What is the error?*

#2: Algebraic Errors.

Shelby was trying to prove this number trick:

- Pick a number
- Double your number
- Add 20
- Divide by 2
- Subtract the original number
- The result is 10

Shelby wrote the following :

Let n be your number

$$2n$$

$$2n + 20$$

$$n + 20$$

$$n + 20 - n$$

$$20$$

Identify and correct Shelby's error.

#3: Division by zero.

Peter claims he can prove that $2 = 5$. His work is shown below:

Peter started by letting two variables be equal:	$a = b$
Multiply both sides by: -3	$-3a = -3b$
Add $5a$ to both sides:	$-3a + 5a = -3b + 5a$
Simplify like terms:	$2a = -3b + 5a$
Subtract $2b$ from both sides:	$2a - 2b = -3b + 5a - 2b$
Simplify like terms:	$2a - 2b = 5a - 5b$
Factor a GCF from each side:	$2(a - b) = 5(a - b)$
Divide both sides by $(a - b)$:	$\frac{2(a - b)}{(a - b)} = \frac{5(a - b)}{(a - b)}$
Simplify:	$2 = 5$

What is the error?

#4: Circular Reasoning

Circular reasoning

- an argument that is incorrect because it makes use of the conclusion to be proved.

For example: starting with an error and then ending by saying that the error has been proved is arguing in a circle.

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Liz claims she has proved that $-5 = 5$.

Liz's Proof

I assumed that $-5 = 5$.

Then I squared both sides: $(-5)^2 = 5^2$

I got a true statement: $25 = 25$

This means that my assumption, $-5 = 5$, must be correct.

Where is the error in Liz's proof?

If an assumption is not true, then any argument that was built on the assumption is not valid.

Circular reasoning has resulted from these steps. Starting with an error and then ending by saying that the error has been proved is arguing in a circle.

circular reasoning

An argument that is incorrect because it makes use of the conclusion to be proved.

Attachments

PM11-1s5.gsp

1s5e1 finalt.mp4

1s5e2 finalt.mp4

1s5e3 finalt.mp4

1s5e4 finalt.mp4

1s5e5 finalt.mp4