

1.5: Proofs That Are Not Valid

Curricular Competencies

I can solve problems with persistence and a positive attitude

I can explain and justify math ideas and decisions

I can use mistakes as opportunities to advance learning

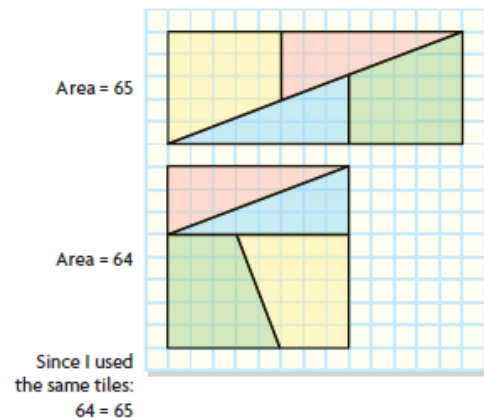
Invalid proof _____

Circular reasoning _____

Consider the following statement: There are tthree errors in this sentence. Is the statement valid? Explain.

This is an example of _____.

Ex: The following is a graphical attempt to show that $64 = 65$.



Since we know that $64 \neq 65$ not true, what is wrong with the argument?

Ex. Students at DPTS attend French classes. Jack is a student at STKR. Therefore Jack attends French class. What is the error in the reasoning?

Ex: Bev claims she can prove that $3 = 4$. She starts with 3 variables such that $a + b = c$ and then performs the following steps. Explain what she is doing at each step and identify where she went wrong.

$$4a - 3a + 4b - 3b = 4c - 3c$$

$$4a + 4b - 4c = 3a + 3b - 3c$$

$$\frac{4(a+b-c)}{(a+b-c)} = \frac{3(a+b-c)}{(a+b-c)}$$

$$4 = 3$$

Ex: Hossai is trying to prove the following number trick:

Choose any number. Add 3. Double it. Add 4. Divide by 2. Take away the number you started with.

Each time Hossai tries the trick, she ends up with 5. Her proof, however, does not give the same result.

Hossai's Proof

n	Choose any number.
$n + 3$	Add 3.
$2n + 6$	Double it.
$2n + 10$	Add 4.
$2n + 5$	Divide by 2.
$n + 5$	Take away the number you started with.

Where is the error in Hossai's proof?

In Summary:

- A single _____ in reasoning will break down the logical argument of a deductive proof. This will result in an _____ conclusion, or a conclusion that is not _____ by the proof.
- Division by _____ always creates an error in a proof.
- _____ reasoning must be avoided! Be careful not to assume a result that follows from _____.
- The reason you write a proof is so that others can _____ and _____ it. After you write a proof, have someone else read it; if they get _____, fix it!

Practice pg 42 # 1, 2, 3, 5, 6, 7, 9