Where do ideas come from?

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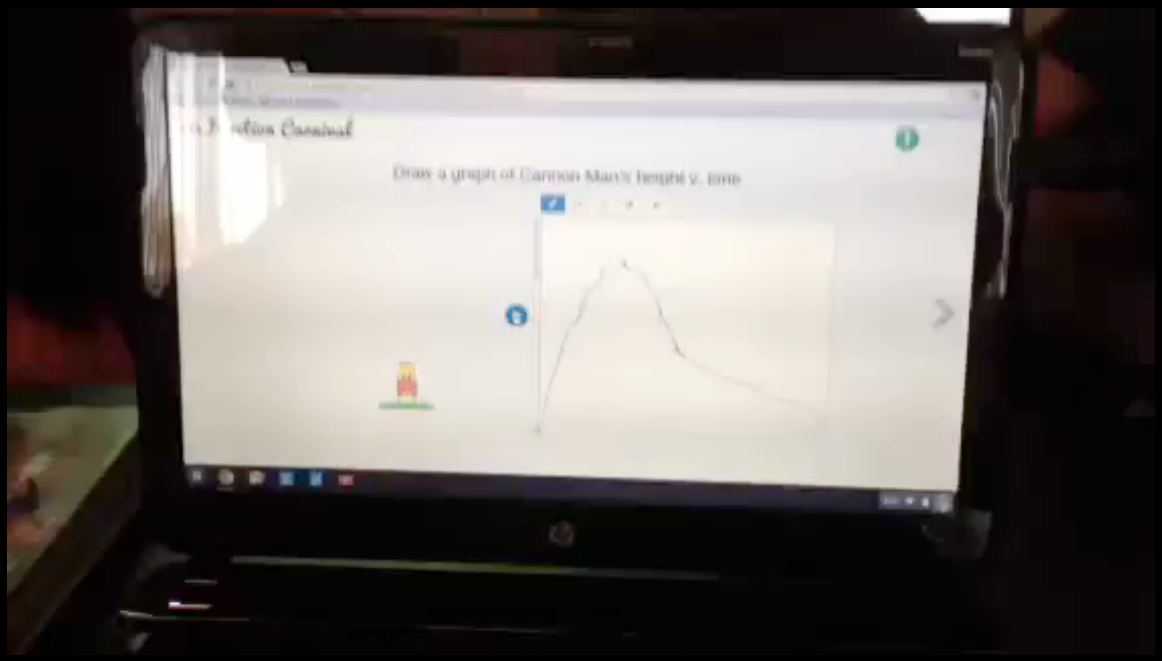
Spirals

Pick one

1. All of the good ideas related to school math have already been had by other people.

2. Students can have original mathematical ideas.

Cannon Man



Why does it matter?

1. Our commitment impacts our effectiveness.

2. Our commitment tells our students what math is.

Elementary school teachers

Cognitively Guided Instruction (CGI)

Join	Separate
Part-part-whole	Compare

1. Abubu had 12 stickers. He lost 4 of them.
   How many does he have left?

2. Janell has 4 trolls in her collection.
   How many more does she have to buy to have 12 trolls?

"Ask *me* a math question!"

“No! Like a math ***class*** question. Like 3+3=4.”

“4?”

“6?”

“5?”

She turns around and thinks quietly for a few seconds.
Her fingers are twitching.

“5.”

“I *said* five!”

High school teachers

Effectiveness

Middle school teachers

Why does it matter?

1. Our commitment impacts our effectiveness.
2. Our commitment tells our students what math is.

On doing mathematics

I used to think *doing mathematics* meant asking and answering questions at the forefront of human knowledge.

Now I know that *doing mathematics* means asking and answering questions at the forefront of my own knowledge.

Replace this:

"That's not how you do it."

"That's not how I showed you."

"You have to…"

"The way it works is…"

With this:

"Tell me what ideas you have…"

"Let me help you make your thinking better."

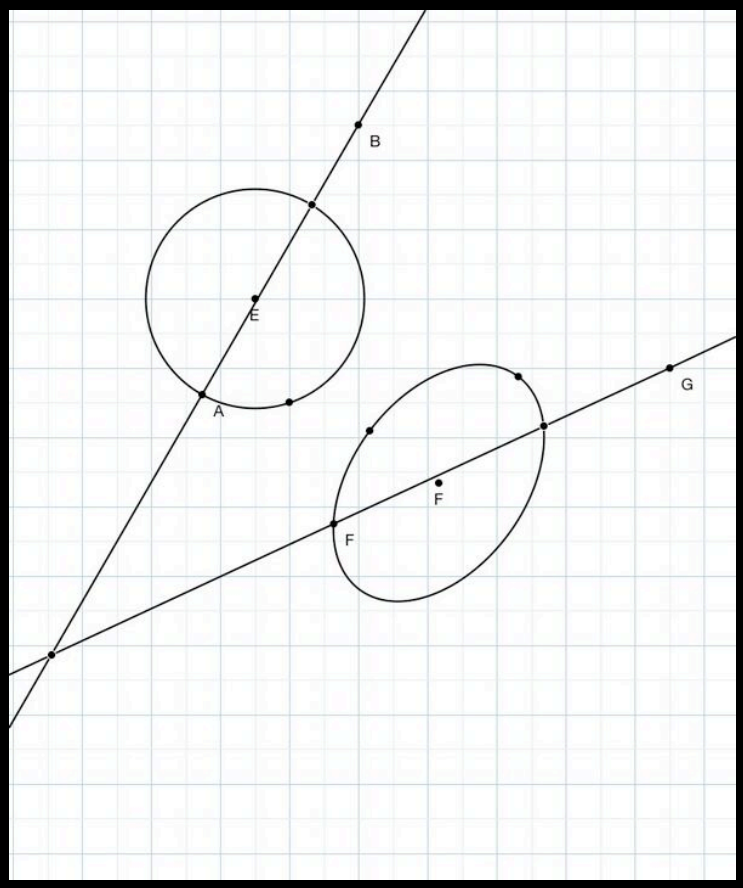
"How did you know to do that?"

"What if...?"

"What about…?"

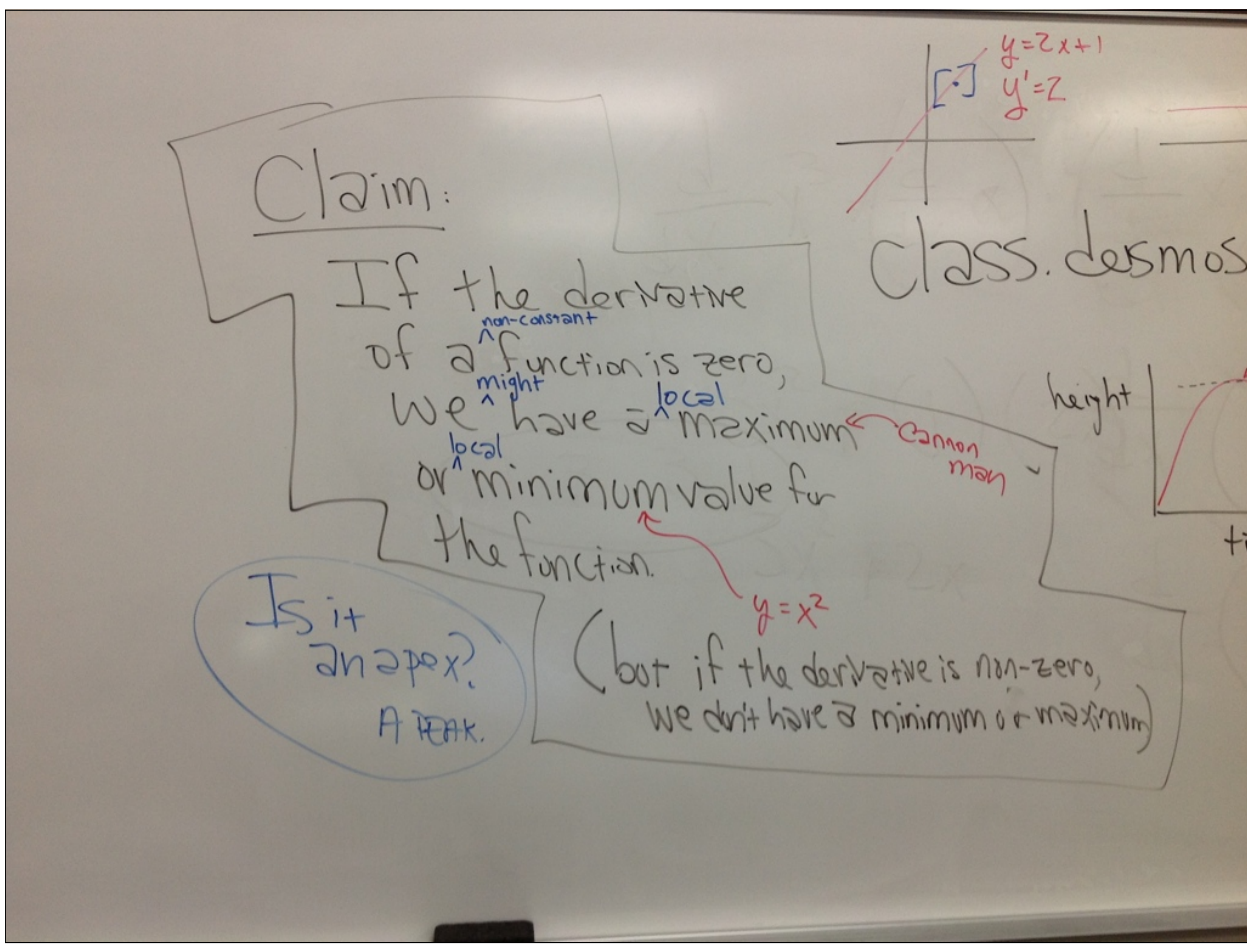
[photo of Braeden]

She told me that I was wrong when I said that an oval didn't have diagonal symmetry and all of the kids said that I was wrong. I think that they were thinking of the letter "o" since it's a circle.
You know what, maybe they were confused with congruence.



4 **Fermat's Theorem** If f has a local maximum or minimum at c, and if $f'(c)$ exists, then $f'(c) = 0$.

WARNING Examples 5 and 6 show that we must be careful when using Fermat's Theorem. Example 5 demonstrates that even when $f'(c) = 0$ there need not be a maximum or minimum at c. (In other words, the converse of Fermat's Theorem is false in general.) Furthermore, there may be an extreme value even when $f'(c)$ does not exist (as in Example 6).

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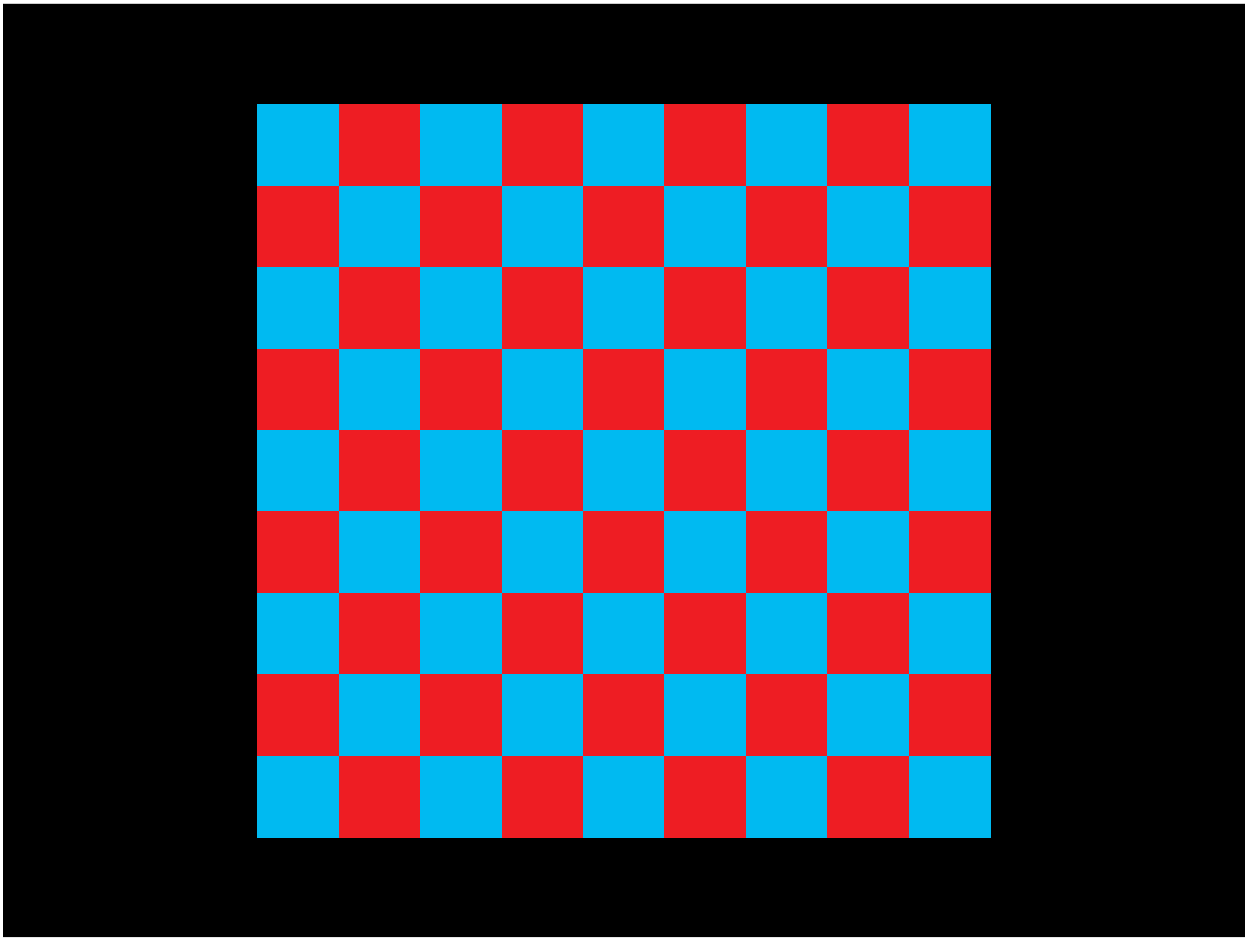

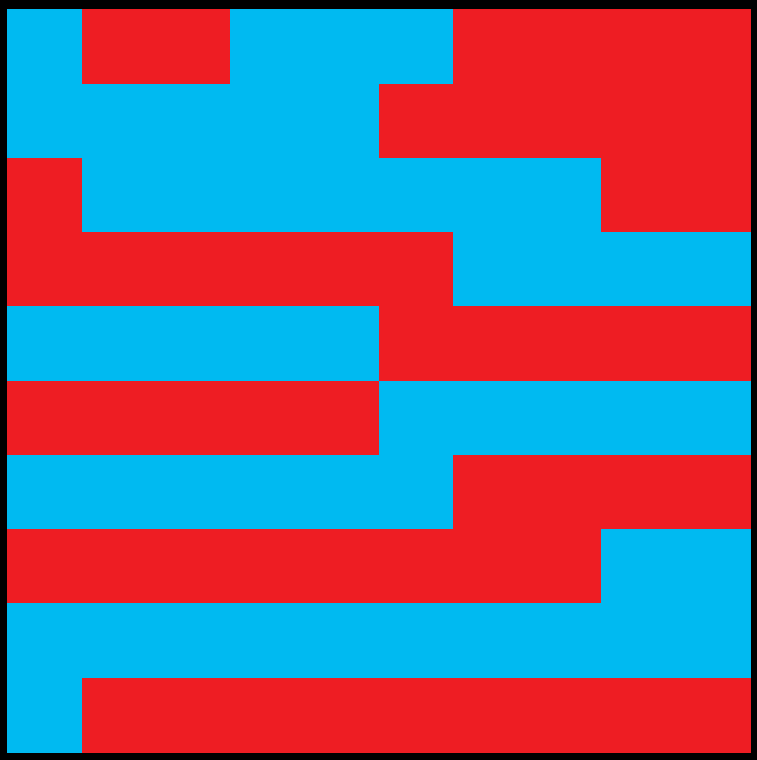

Resources

- *Children's Mathematics* and *Extending Children's Mathematics* published by Heinemann
- class.desmos.com/carnival
- christopherdanielson.wordpress.com
- talkingmathwithkids.com

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