Developing Persistence in Problem Solving in relation to the *MAA Instructional Practices Guide*

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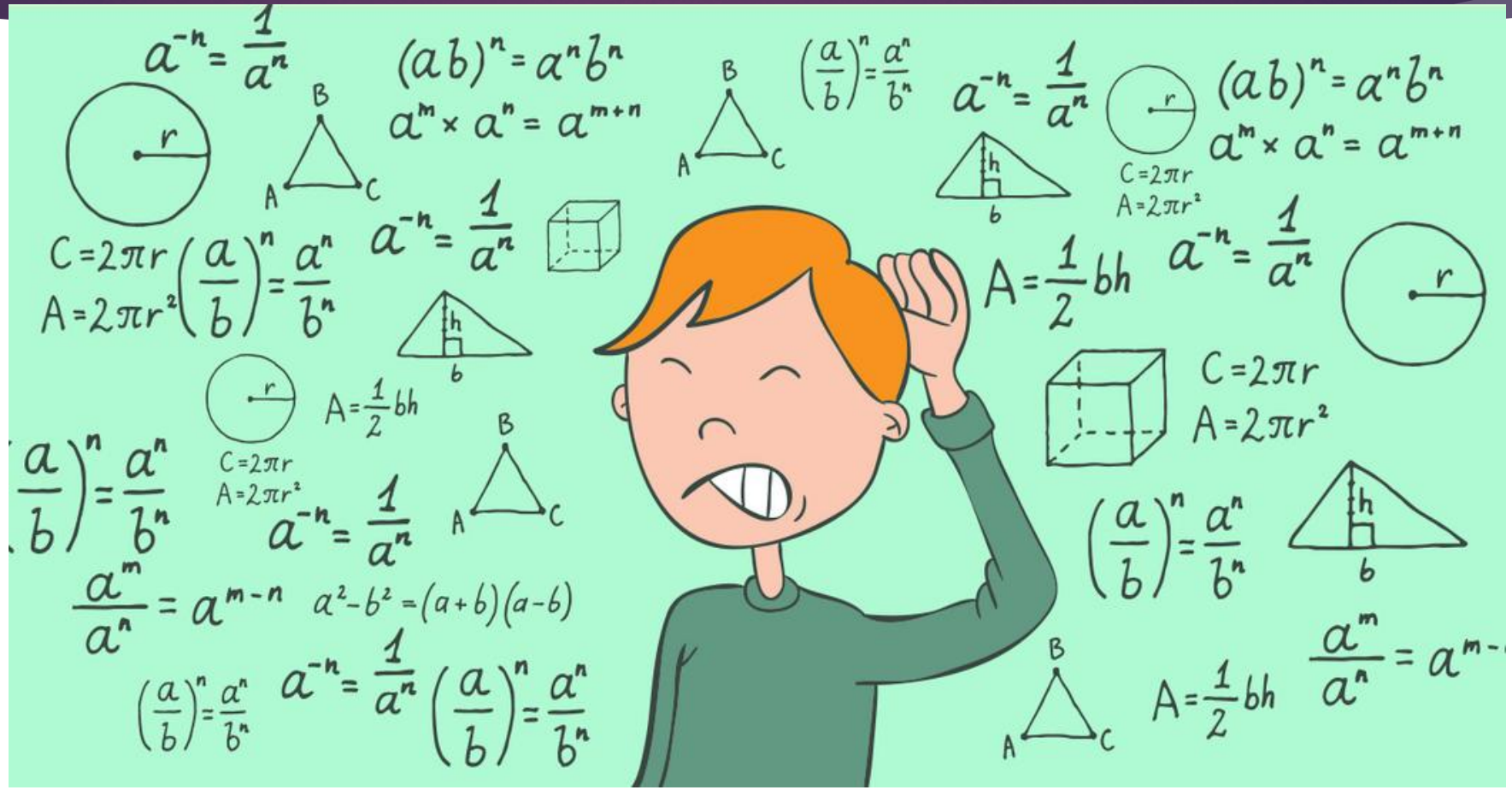
What does it mean to do math?



What is mathematics?

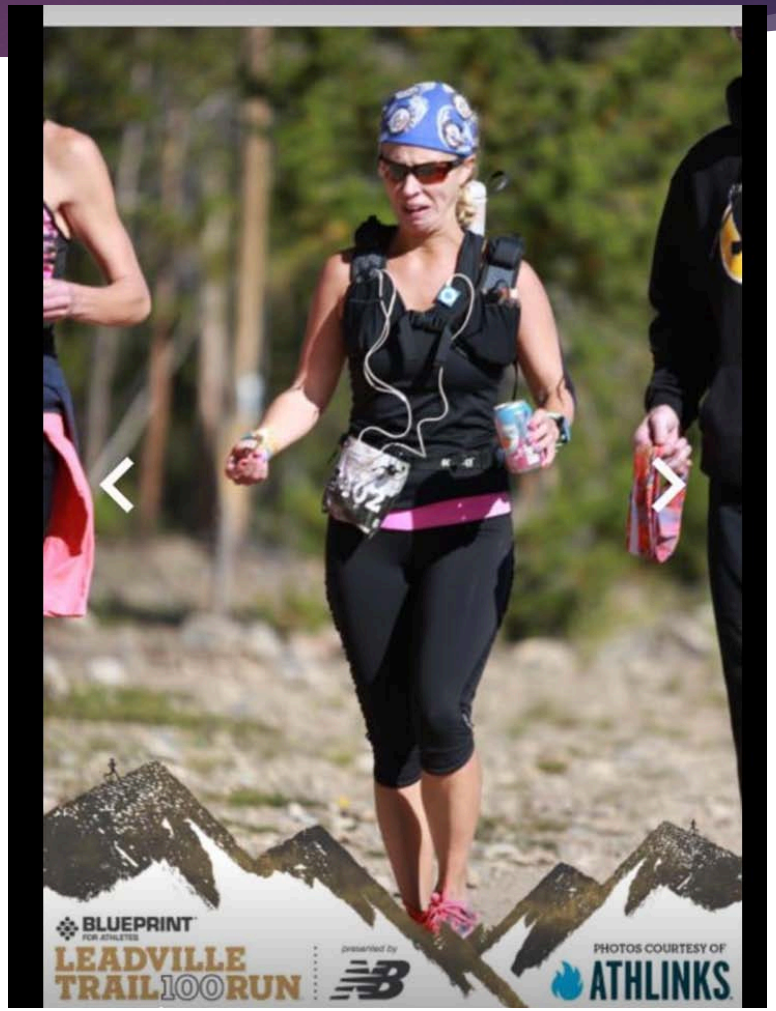
- What do most people think it means to do mathematics?

- Why might this hinder learning in your active learning mathematics classroom?

Persistence

"Student actions that include students concentrating, applying themselves, believing they can succeed, and making effort to learn" (Clarke et al., 2014, p. 67).

Why run 100 miles?



Persistence

Perseverance can be improved!

The IP Guide gives us tips on how it can be improved!

Types of problems

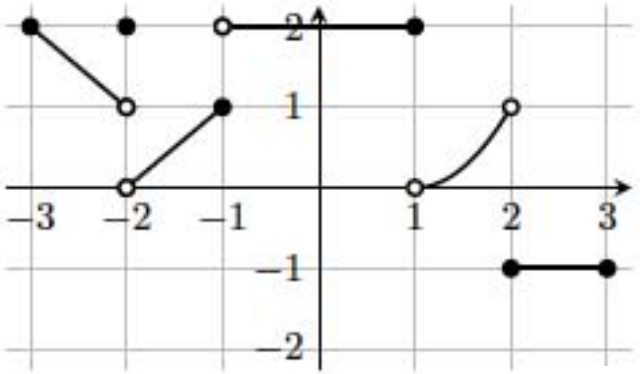
Find the one-sided limit (if it exists):

1. $\lim_{x \to 1^-} \frac{-1}{(x-1)^2}$

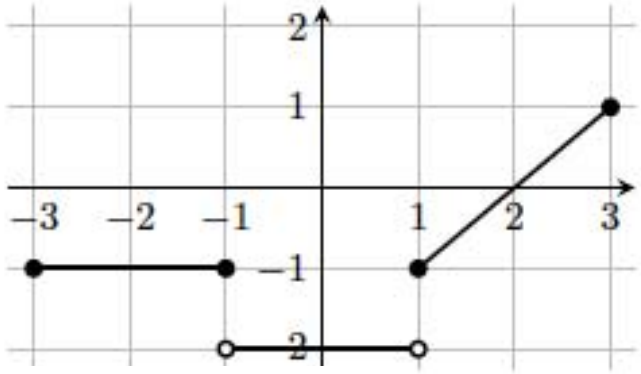
2. $\lim_{x \to 0^+} \left(6 - \frac{1}{x^3}\right)$

These limits are wacky. Help me understand the key. All I have is the answers and not the reasons why the answers are what they are. Do this by providing the correct mathematical reasons/work explaining how one gets the correct answer.

Graph of f



Graph of g



10. $\lim_{x\to 2} \dfrac{f(x)}{g(x)} = -\infty$

11. $\lim_{x\to 3^-} f(g(x)) = 2$

12. $\lim_{x\to -2^-} g(f(x)) = -1$

Bike video

https://www.youtube.com/watch?v=9brnDOVJWnw

IP Guide Suggestions

- Require students to struggle constructively (resist urge to tell)
- Allow students to work in groups.
- Set up the lesson carefully.
  - Allow for mini lessons and ”hints.”
  - End the lesson with a wrap up.

IP Guide Suggestions

- Encourage a growth mindset.
- Give students plenty of time.
- Talk about their thinking strategies – marketing!

Any questions?

Thank you!

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