

How do we teach STEM faculty to use tactile learning activities in their classrooms?

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Who we are...

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Impetus for this presentation

- TACTivities
 - Tactile learning activities
- Methods used to engage students actively in mathematics
 - Both in-person/f2f and remotely/virtually (online)
- Not restricted to mathematics (any other subject area can use these too)

What is a TACTivity?

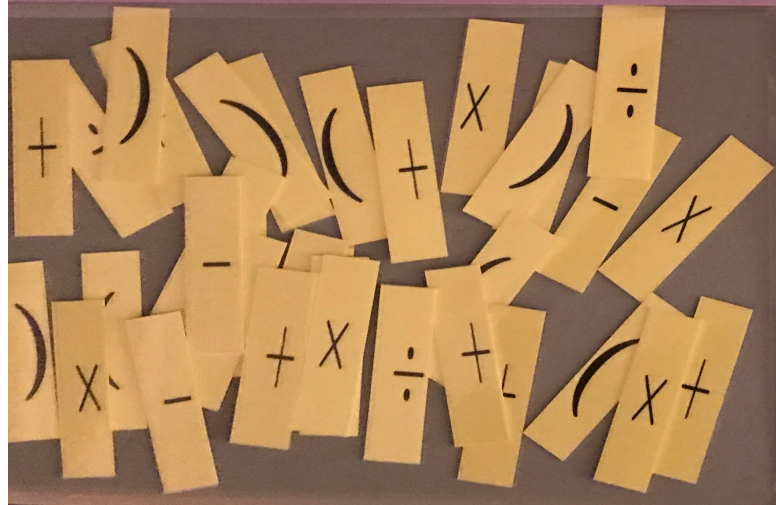
- A tactile activity that encourages collaboration and engagement.
- Tactile (movable pieces)
- Actively engages students
- Can be used to help teach or to review a concept
- Most are designed for groups of 2-4 students
- Often self-checking
- Very few (if any) directions needed

Example TACTivity



4	4	4	4	= 1
4	4	4	4	= 9
4	4	4	4	= 4

4	4	4	4	= 3
4	4	4	4	= 8
4	4	4	4	= 5

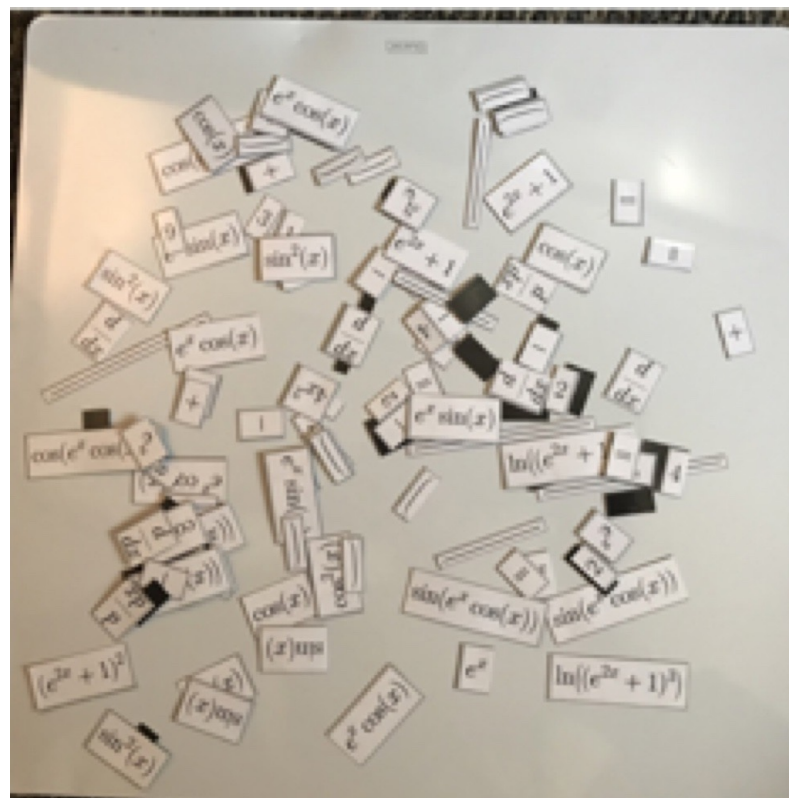


4	4	4	4	= 2
4	4	4	4	= 7
4	4	4	4	= 6



Four fours

4	4	4	4	=3	(+ - + ÷
4	4	4	4	=8) +) + ×
4	4	4	4	=5	- - ÷ × ×
4	4	4	4		(- + ()



$$\cos^2(x) \cdot x^2 \cdot e^{2x} \left(\frac{d}{dx} \left[1 + 2e^x \sin^2(x) \right] = 2e^x \sin^2(x) + 4e^x \sin(x) \cos(x) \right)$$

$$\frac{d}{dx} \left[\cos(x) \ln((e^{2x} + 1)^3) \right] = \frac{6 \cos(x) e^{2x}}{e^{2x} + 1} - \sin(x) \ln((e^{2x} + 1)^3)$$

$$\frac{d}{dx} \left[6 + 3e^{2x} \right] = 6e^{2x} \quad \frac{d}{dx} \left[2(e^{2x} + 1)^2 \right] = 4e^{2x} (e^{2x} + 1)$$

$$\frac{d}{dx} \left[\frac{\cos(e^x \cos(x))}{3} \right] = -\frac{1}{3} \sin(e^x \cos(x)) (e^x \cos(x) - e^x \sin(x))$$

$$\frac{d}{dx} \left[\sin(e^x \cos(x)) \right] = \cos(e^x \cos(x)) (e^x \cos(x) - e^x \sin(x))$$

$$\frac{d}{dx} \left[2e^x \sin^2(x) \right] = 4e^x \cos(x) \sin(x) + 2e^x \sin^2(x)$$

$$\frac{d}{dx} \left[\left(1 + e^x \sin(x) + \frac{\ln(\sin(x))}{2x} \right) \right] = e^x \sin(x) + e^x \cos(x) + \frac{2x \cos(x)}{\sin(x)} - 2 \ln(\sin(x))$$

$$\frac{1}{4x^2}$$

$$\frac{d}{dx} \frac{e^{2x} + 2}{e^x \cos(x)}$$

$$e^x \cos(x) \left(\left(2e^{2x} + 2 \right) - \left(e^{2x} + 2x \right) \left(-e^x \sin(x) + e^x \cos(x) \right) \right)$$

$$\left(e^x \cos(x) \right)^2$$

Math Joke Sort

I just saw my math teacher with a piece of graph paper.

quadratic formula

How do you know your math tutor is hungry?

Parallel numbers have too much in common

An opinion without 3.14159

Because it is never right.

He'll work for pi.

Go into the corner where it is always 90 degrees.

What do baby numbers drink?

My girlfriend is the square root of -100.

It's a shame they will never meet.

She must be plotting something.

Why is the obtuse triangle depressed?

She's a perfect 10, but purely imaginary.

is just an onion.

Because it gives them square roots.

Why did the 30-60-90 degree triangle marry the 45-45-90 degree triangle?

How do you stay warm in an empty room?

Because they were right for each other.

Just cos.

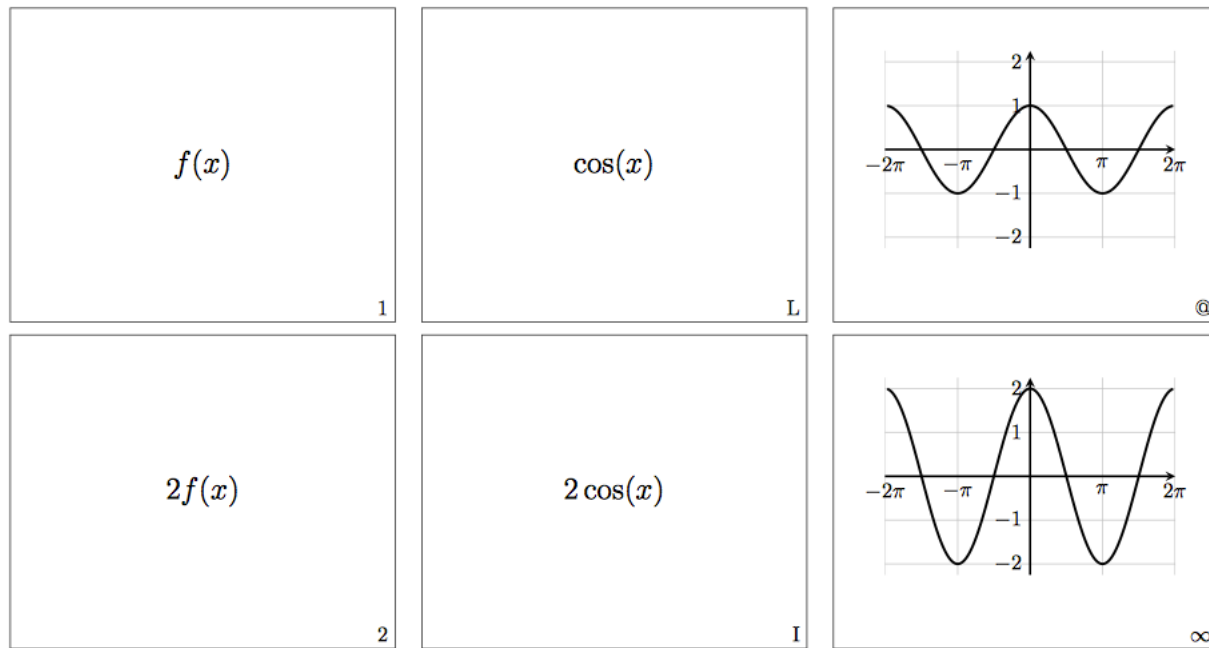
have trouble with fractions

Why do plants hate math?

60 out of 50 people

Why did I divide sin by tan?

Sorting TACTivities



Create a virtual TACTivity!



Desmos activity builder: <https://teacher.desmos.com>



Card sort



Ordering steps



Interactive slides



Google slides



Dominoes



Other - ???

To provide us feedback:

What faculty might need to know to use TACTivities successfully in their classroom...

padlet.com/cindyork/sj9af47fra5khk5q

