

## Class Plan:

1. Number Talk

2. MathTube!

3. Coloring Links

4. Reflect and Set Goals



# Pattern/Dot/Number Talks

## Expectations and Purpose

- Build Number Sense!
- Many ways to see/do any problem.
- Communicate thinking clearly so others can understand.
- Try to understand other people's thinking.

# Pattern/Dot/Number Talks

## Procedure:

1. Place your hand on your heart.
2. When you have a strategy to solve, put up one finger.
3. If you have 2 strategies, put up 2 fingers.

## Number Talk

Solve as many ways as you can!

Use paper, no calculator for now :)

Grace  $12 \times 14$

$$\begin{array}{r} 12 \\ \cdot 14 \\ \hline 48 \\ +120 \\ \hline 168 \end{array}$$

$12(12) + 2(12)$

Josie

Shae  
(calc.)

Jonah  
 $10(14) + 2(14)$

Augusta

$$\begin{array}{r} 14 \\ \downarrow \\ 14 \\ \vdots \end{array}$$

$$\begin{array}{r} 12 \\ \downarrow \\ 12 \end{array}$$



$$12 \times 14$$

Sophia

$$12(10) + 12(4)$$

Jill

$$7(8)(3)$$

$$\frac{14}{2} = 7$$

Toby

Ask someone

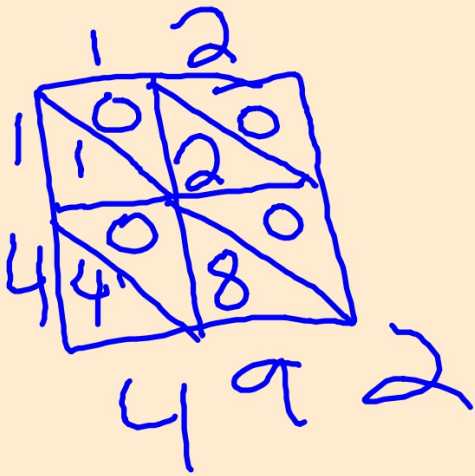
Jadyn



$$12 \times 14$$

Toby

$$13^2 - 1$$



6(7)(4)  
Alex



## Number Talk

Solve as many ways as you can!

Use paper, no calculator for now :)

$$12 \times 14$$

Isaac

$$12 \times 12 + 12 \times 2$$

$$144 + 24 = 168$$

$$\begin{array}{r} 12 \\ + 12 \\ + \quad ; \\ + \quad ; \\ \hline 168 \end{array}$$

Hannah



August

$$12 \times 14$$

$$12(15) - (12(1))$$

Sahel;

	1	2	
0	1	0	1
0	4	0	2
1	6	8	21

= 168

Sudie

$$\begin{array}{r} 12 \\ \times 14 \\ \hline \end{array}$$

$$\begin{array}{r} 100 \\ 40 \\ 20 \\ 8 \\ \hline 168 \end{array}$$





$$12 \times 14$$

Eli

$$12 \times 10 + 12 \times 4 = 168$$

Landon

$$\begin{array}{r} 14 \\ 14(12) \times 12 \\ \hline 140 \\ + 28 \\ \hline 168 \end{array}$$

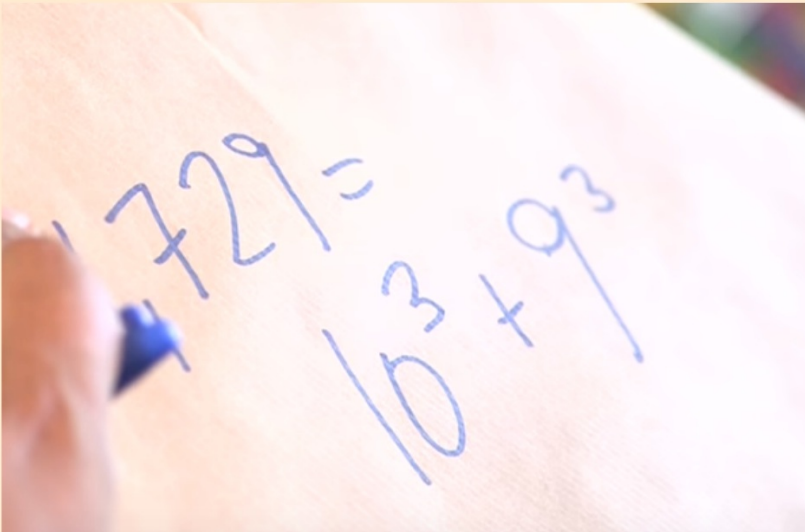
$$\begin{array}{r} 12 \cdot 14 \\ 100 \\ \cdot 8 \\ 20 \\ + 40 \\ \hline 168 \end{array}$$





# MathTube! Taxi Cab Numbers

<https://www.youtube.com/watch?v=bJDIZi9dqOg>



# Taxi Cab Numbers

## Taxicab number

From Wikipedia, the free encyclopedia

In **mathematics**, the *n*th **taxicab number**, typically denoted  $Ta(n)$  or  $Taxicab(n)$ , also called the *n*th **Hardy–Ramanujan number**, is defined as the smallest number that can be expressed as a sum of two *positive cube numbers* in *n* distinct ways. The most famous taxicab number is  $1729 = Ta(2) = 1^3 + 12^3 = 9^3 + 10^3$ .

The name is derived from a conversation in about 1919 involving **mathematicians** **G. H. Hardy** and **Srinivasa Ramanujan**. As told by Hardy:

“ I remember once going to see him (Ramanujan) when he was lying ill at Putney. I had ridden in taxi-cab No. 1729, and remarked that the number seemed to be rather a dull one, and that I hoped it was not an unfavourable omen. "No", he replied, "it is a very interesting number; it is the smallest number expressible as the sum of two [positive] cubes in two different ways."<sup>[1][2]</sup>

[https://en.wikipedia.org/wiki/Taxicab\\_number](https://en.wikipedia.org/wiki/Taxicab_number)



**MathTube!**

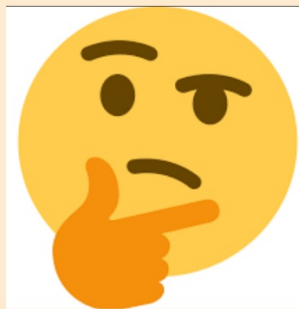
## Fermat's Last Theorem...

### Fermat's Last theorem

There are no three positive integers  
 $x$ ,  $y$ , and  $z$  for which

$$x^n + y^n = z^n$$

for any integer  $n > 2$





**MathTube!**

**Best way to cut a cake?**



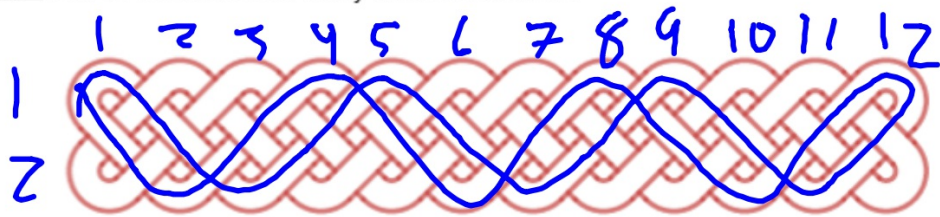
# Knots, Links, & Learning

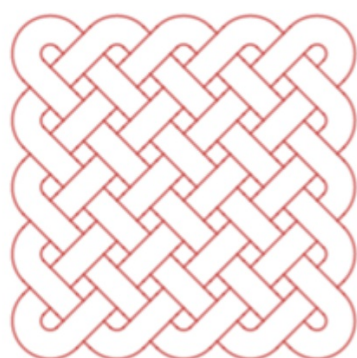
Do: Color Links!

Investigate: How do we know how many links there will be?



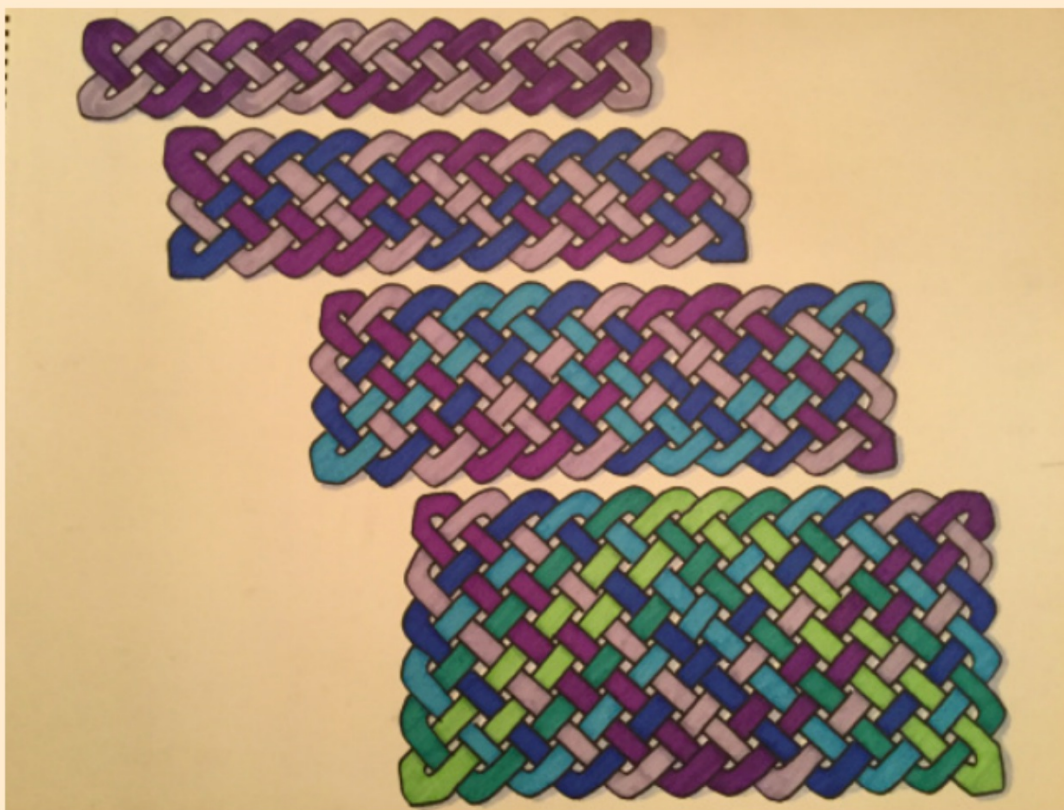
Coloring Links - How do we know how many links there will be?



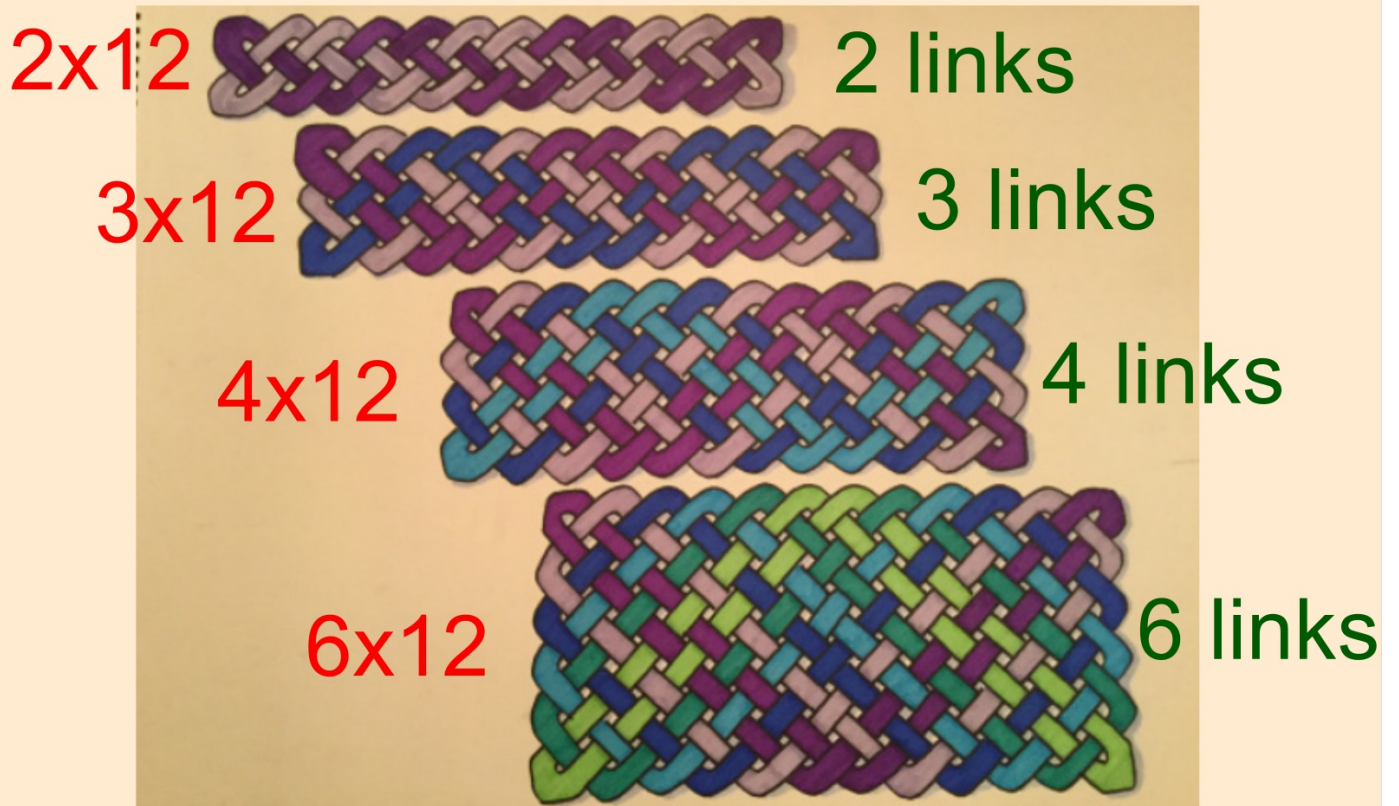




Based on Dimensions...How many Links?



# Based on Dimensions...How many Links?



Based on Dimensions...How many Links?

5x5

6x3

8x6



5 links

3 links

2 links

# links with corners missing

<https://www.desmos.com/calculator/dulkjukuqv>

The image shows a screenshot of a Desmos calculator interface titled "Knots/links 2". The interface features a control panel on the left with several adjustable parameters, each with a slider and a close button (X):

- Width**: A slider with a close button (X).
- $m = 8$** : A slider with a close button (X), ranging from 1 to 12.
- Height**: A slider with a close button (X).
- $n = 10$** : A slider with a close button (X), ranging from 1 to 14.
- Thickness**: A slider with a close button (X).
- $k = 0.4$** : A slider with a close button (X), ranging from 0 to  $\frac{1}{\sqrt{2}}$ .

On the right side of the interface, a complex, highly detailed knot or link is displayed. The knot is a dense, repeating pattern of interlocking loops, forming a roughly square shape with rounded corners. The lines are white with black outlines, set against a white background.

# nxm grid

<https://www.desmos.com/calculator/hzizduqvup>

The screenshot shows a Desmos calculator window titled "Knots/links 2". The interface includes a sidebar with several adjustable parameters, each with a play button and a close button (X):

- Width**: A slider ranging from 1 to 12.
- $m = 3$** : A slider ranging from 1 to 12.
- Height**: A slider ranging from 1 to 14.
- $n = 4$** : A slider ranging from 1 to 14.
- Thickness**: A slider ranging from 0 to  $\frac{1}{\sqrt{2}}$ .
- $k = 0.43$** : A slider ranging from 0 to  $\frac{1}{\sqrt{2}}$ .
- $[0, \dots, n(m-1) - 1]$** : A list input field.

The main canvas displays a red knot visualization, which is a complex, interlocking pattern of lines forming a square-like shape with internal crossings.

# Exit Ticket:

Reflection on Quarter 1

Name \_\_\_\_\_

- 1) What is going **well** in math?
  
- 2) What would you like to **improve** upon?
  
- 3) What was **challenging** this quarter? Why so?
  
- 4) Set **one goal** for next quarter. What will you **do** to reach this goal?

Goal: \_\_\_\_\_

I will \_\_\_\_\_

\_\_\_\_\_

- 5) Other comments?

**Exercises...**

**Continue coloring links!**

**Enjoy time with friends & family**