desmos

Math Task Makeover

Desmos Activity Builder

NCTM 2017

Bob - Jed - Michael

Engage with **us**

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Follow up: *Reflection Cove 1* 11am-12pm

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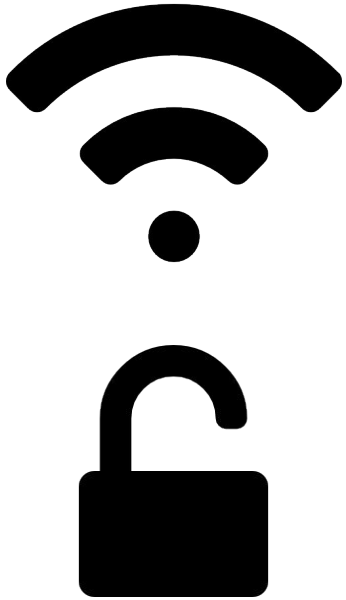
WiFi



Hey, students!

Go to student.desmos.com
and type in:

EHYR8

1 - LINEAR INEQUALITIES

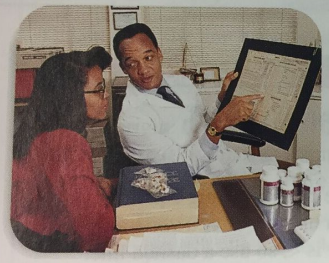
6.8

Graphing Linear Inequalities in Two Variables

alities

in

How can you plan a healthy meal?



Nutritionists advise that you eat a variety of foods. Your diet should supply all the nutrients you need with neither too few nor too many calories. In Exercises 51 and 52 you will use inequalities to plan a meal.

EXAMPLE 5 *Use Slope-Intercept Form*

Graph the inequality $2x - y \geq -2$ using the slope-intercept form of the corresponding equation.

Solution

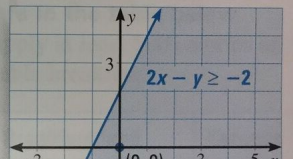
Write the corresponding equation in slope-intercept form.

$2x - y = -2$ Write corresponding equation.

$-y = -2x - 2$ Subtract $2x$ from each side.

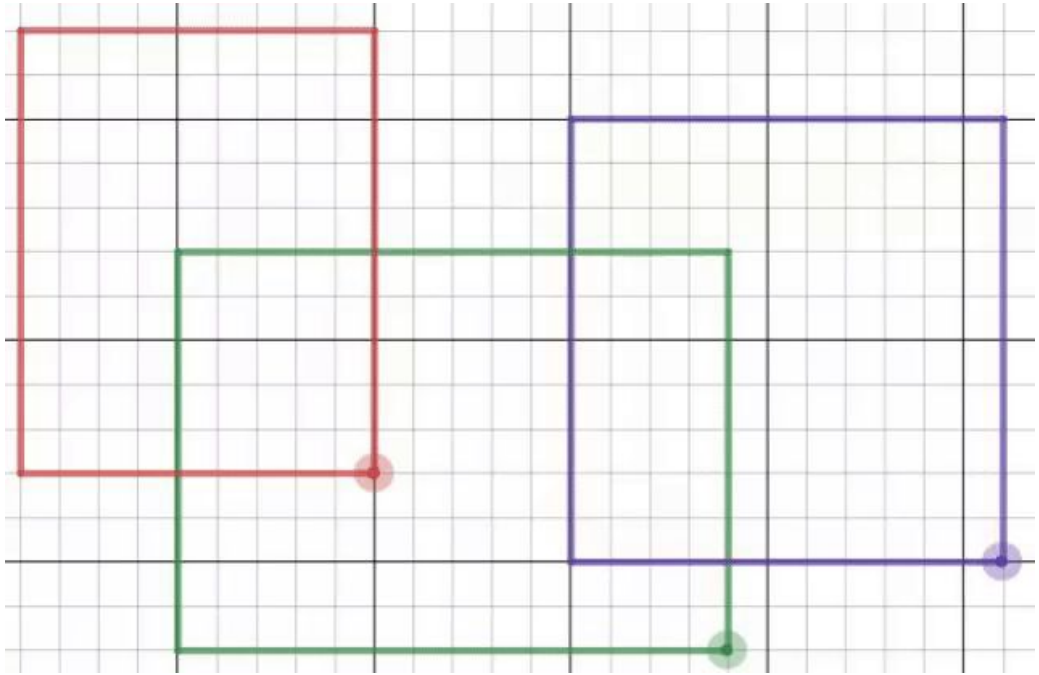
$y = 2x + 2$ Multiply each side by -1.

The graph of the line has a slope of 2 and a y-intercept of 2. The inequality is $\geq$, so use a solid line.

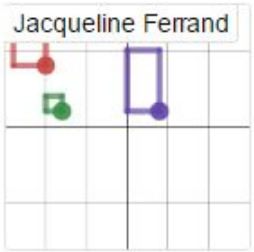


Test the origin: $2(0) - 0 = 0$ and 0 is greater than -2, so (0, 0) *is* a solution. Since (0, 0) lies

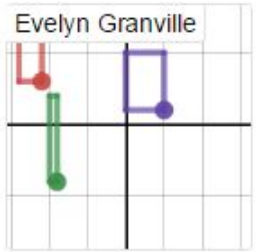
SIMPLE TASKS … LEAD TO GROUP DATA

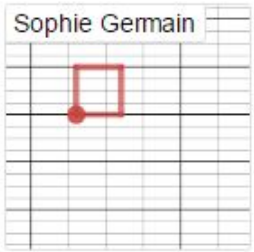


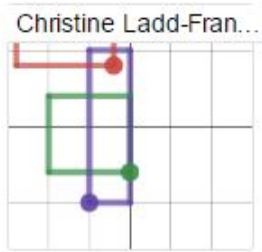
Drag the corner points to create 3 different rectangles, which each have perimeter less than or equal to 30 units.

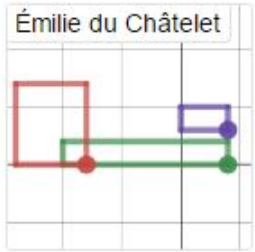

Jacqueline Ferrand

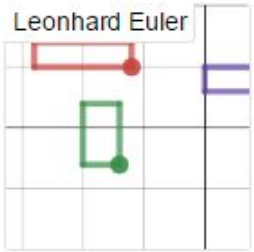

Shigefumi Mori

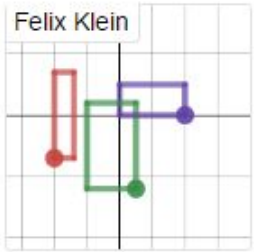

Evelyn Granville

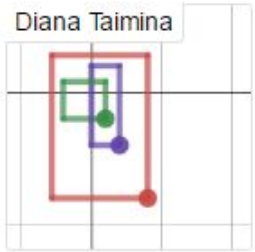

Sophie Germain

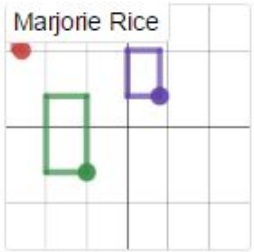

Christine Ladd-Fran...


Émilie du Châtelet

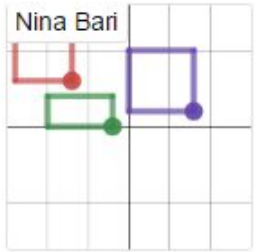

Leonhard Euler

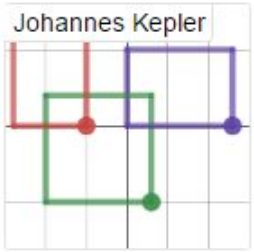

Felix Klein

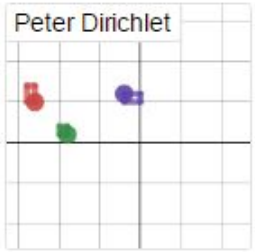

Diana Taimina

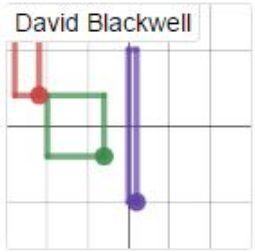

Marjorie Rice

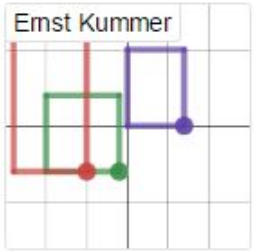

Adrien Legendre

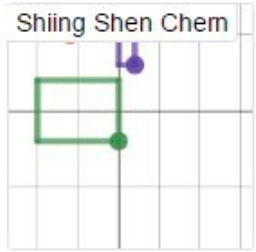

Nina Bari

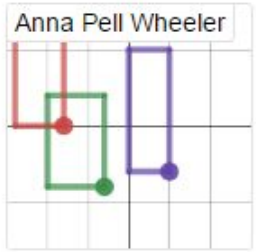

Johannes Kepler

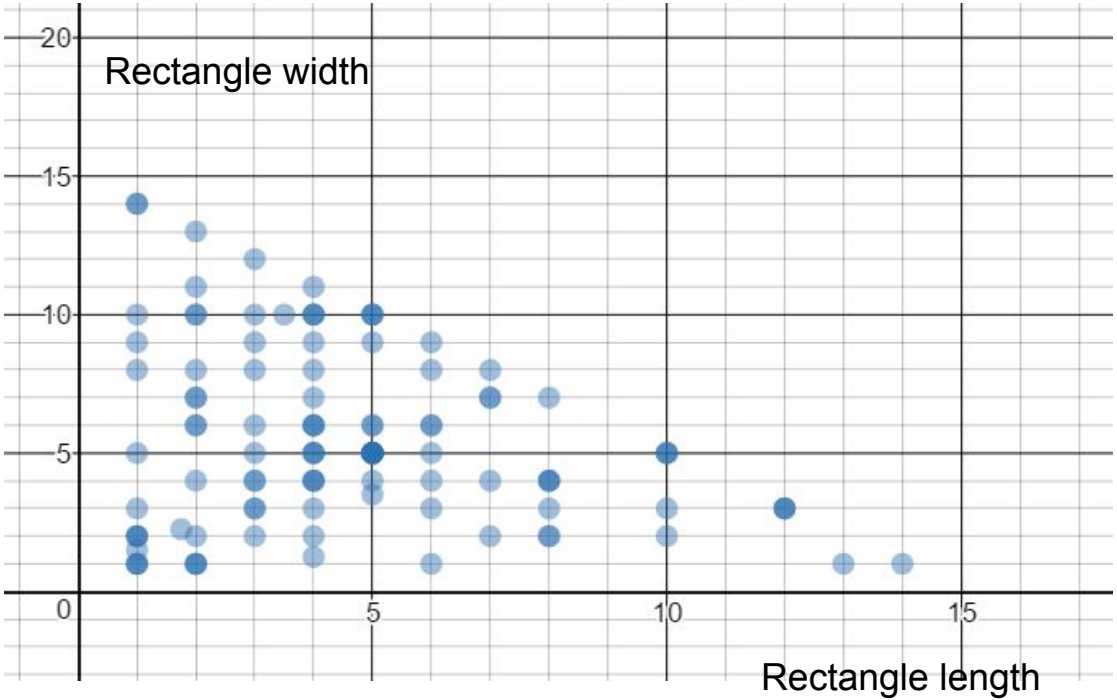

Peter Dirichlet


David Blackwell


Ernst Kummer


Shiing Shen Chern

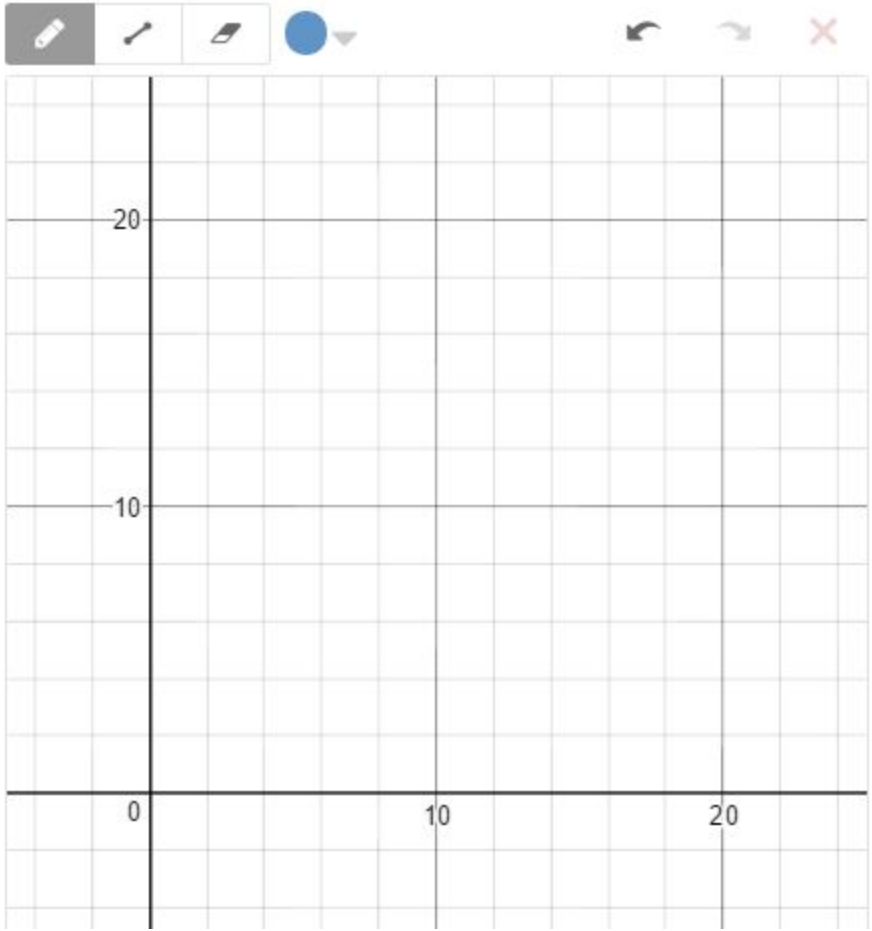

Anna Pell Wheeler



What do you notice / wonder?

Where will we go next with this?

Give me ALL THE RECTANGLES!



If we could plot the length and width of EVERY POSSIBLE RECTANGLE with a perimeter less than or equal to 30, what would it look like?

Sketch your ideas on the graph given here.

10 Give me ALL THE RECTANGLES!

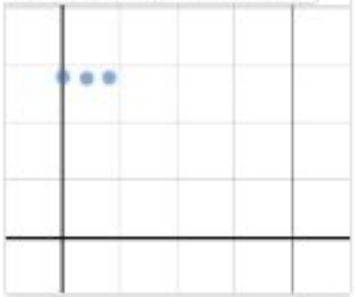
Preview

If we could plot the length and width of EVERY POSSIBLE RECTANGLE with a perimeter less than or equal to 30, what would it look like?

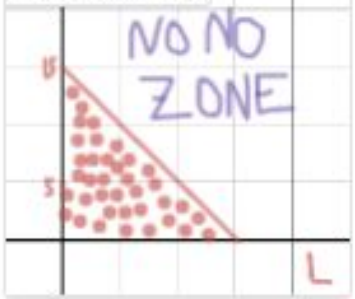
Sketch your ideas on the graph given here.

Responses | Sketch Overlay

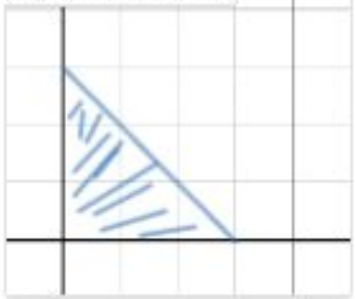
Courtney Gibbons



Sophus Lie



Alice Schafer



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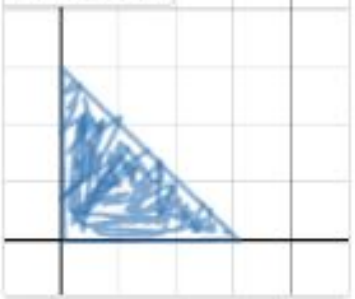
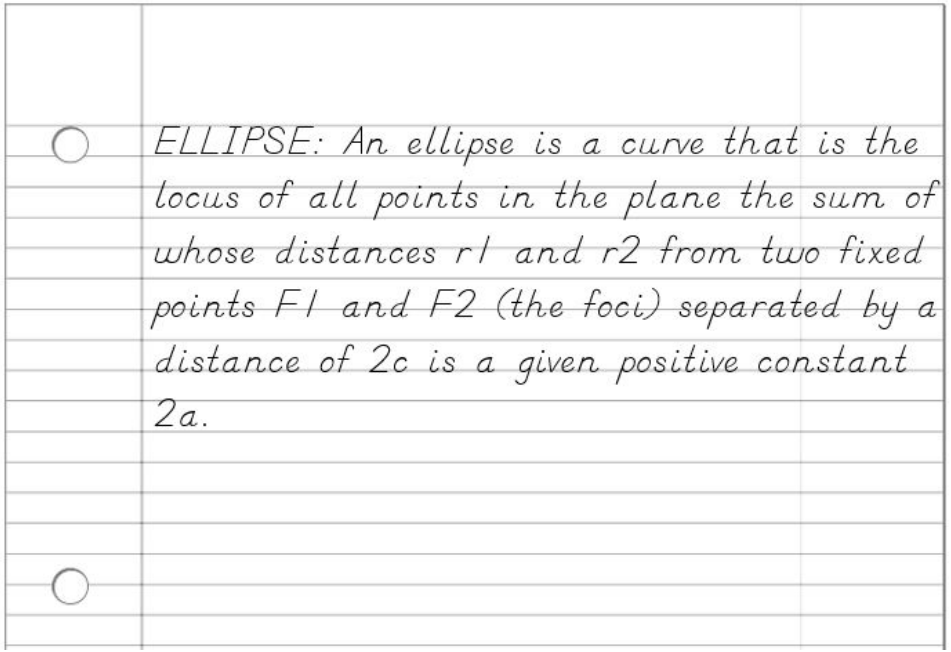


TASK MAKEOVER - ELLIPSES



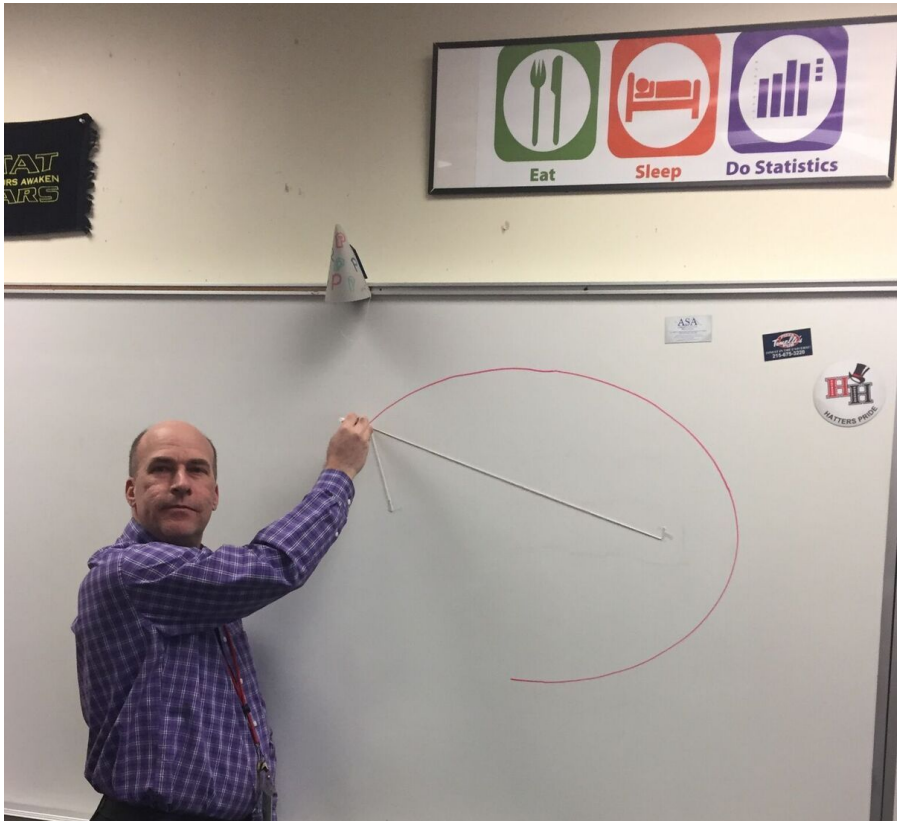
Use the information provided to write the standard form equation of each ellipse.

1) Vertices: $(-9, 2), (-9, -16)$
   Foci: $(-9, -7 + 4\sqrt{2}), (-9, -7 - 4\sqrt{2})$

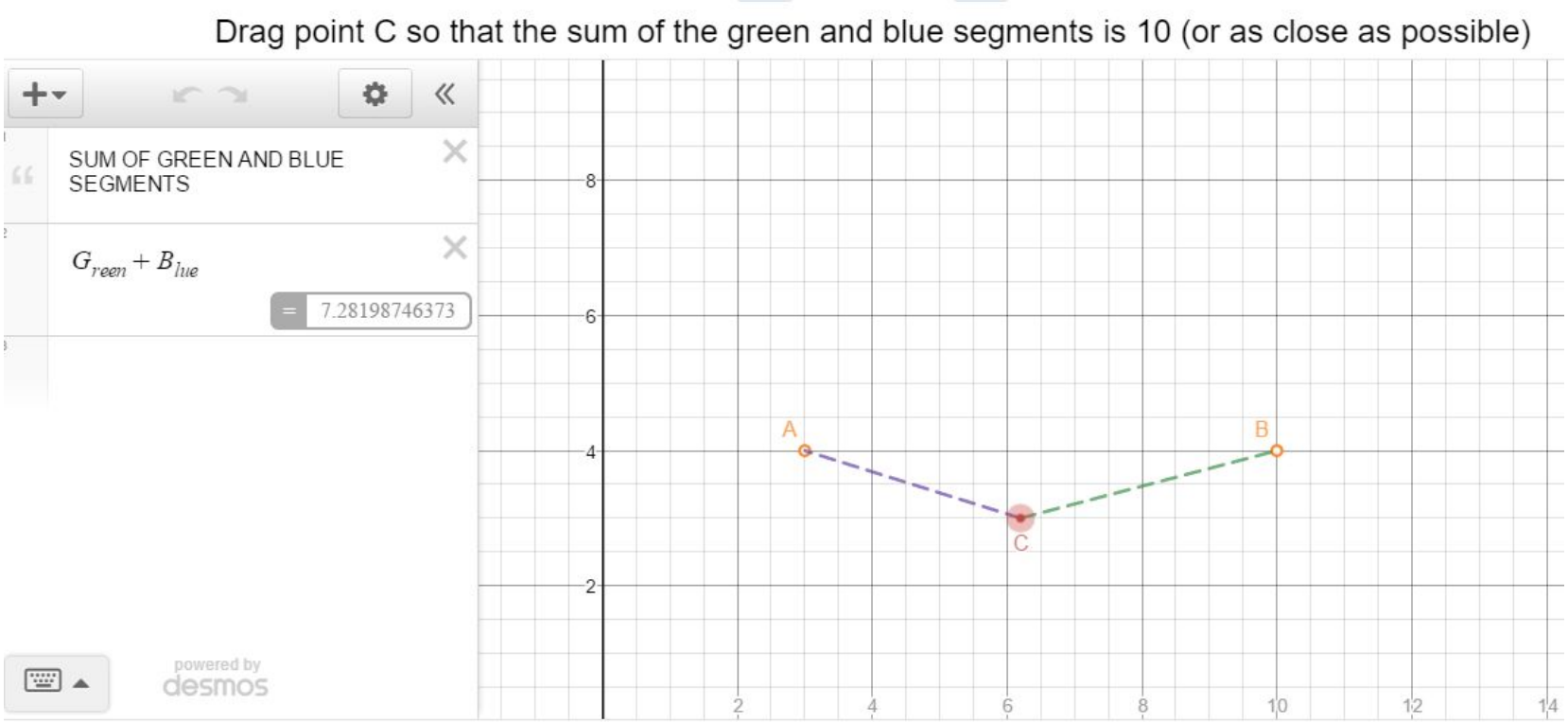
Use the information provided to write the standard form equation of each ellipse.

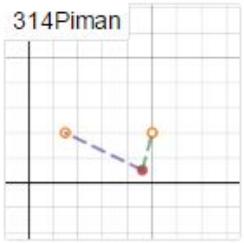
2) Foci: $(8, -7 + \sqrt{95}), (8, -7 - \sqrt{95})$
   Endpoints of major axis: $(8, -7 + \sqrt{110}), (8, -7 - \sqrt{110})$

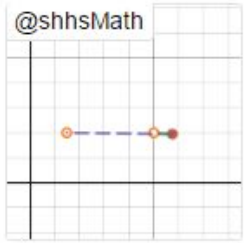
TASK MAKEOVER - ELLIPSES

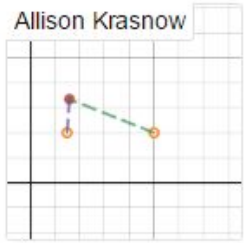


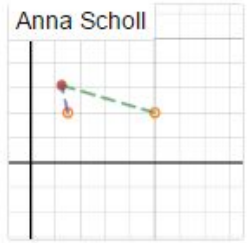
“SCARY” DEFINITIONS … ACCESSIBLE

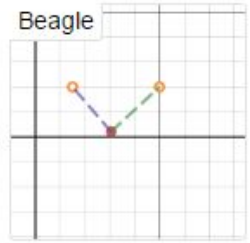



314Piman


@shhsMath


Allison Krasnow


Anna Scholl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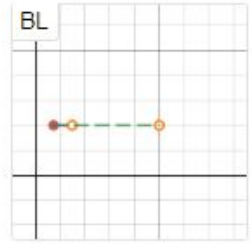
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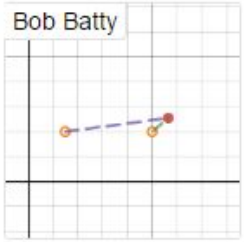
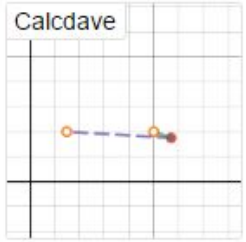
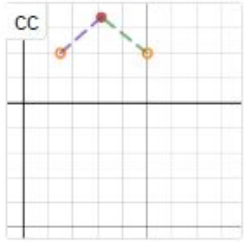

Bob Batty


Calcdave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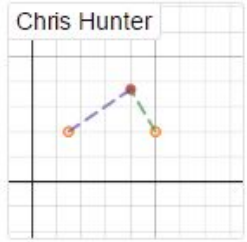
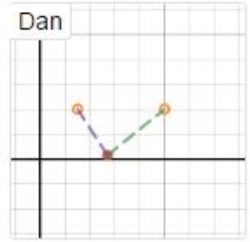
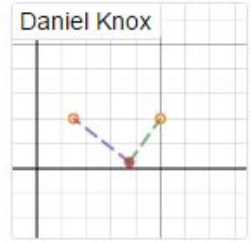
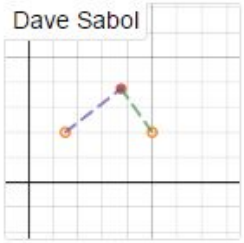
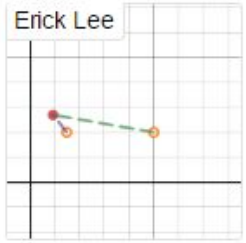
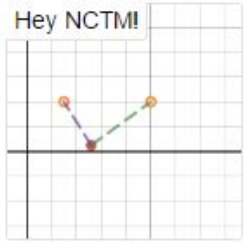

Chris Hunter

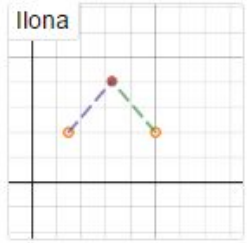

Dan

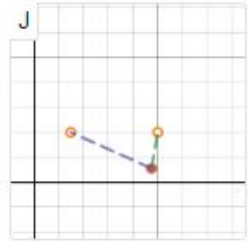

Daniel Knox


Dave Sabol


Erick Lee


Hey NCTM!


Ilona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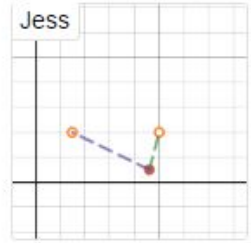
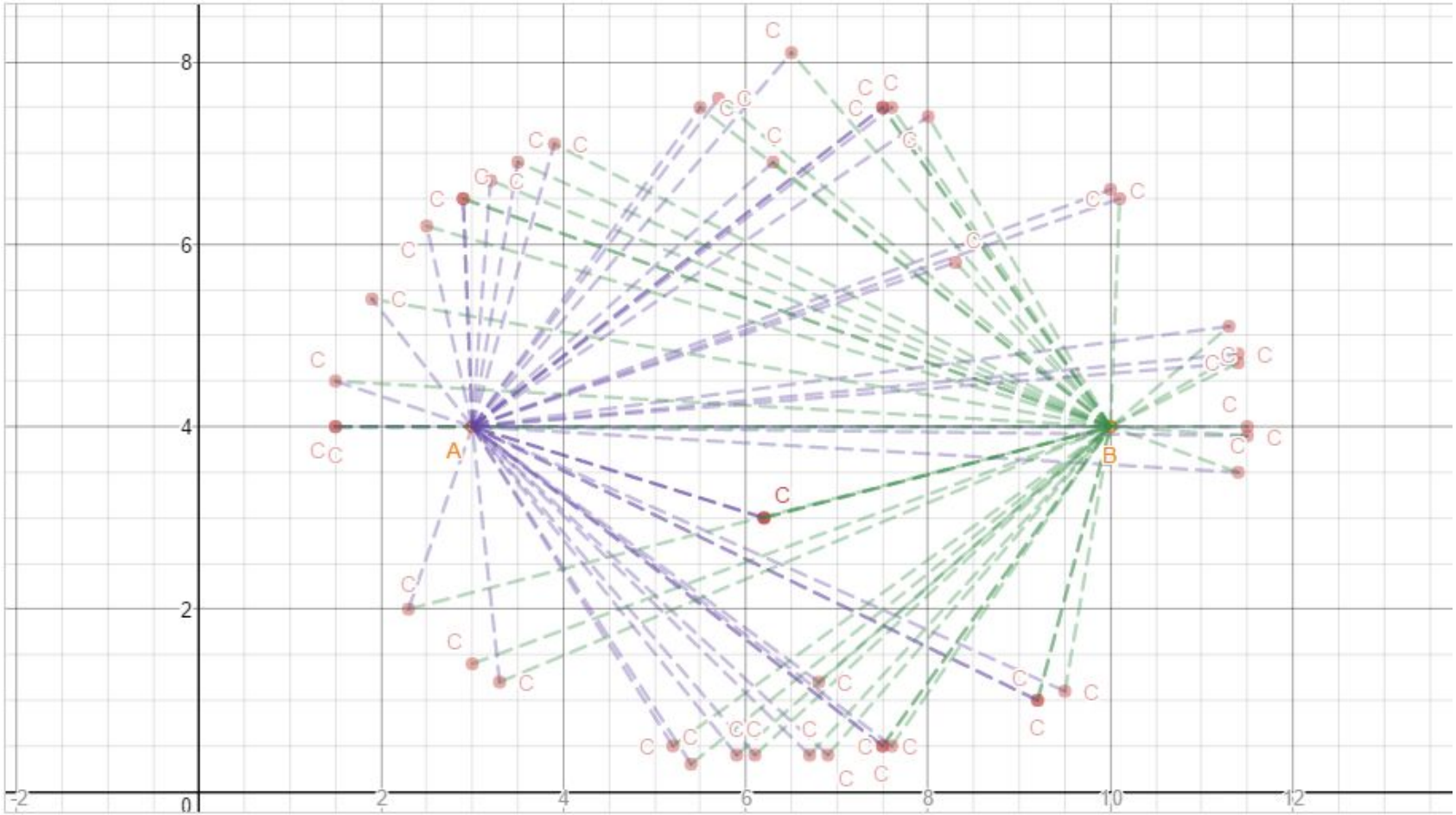
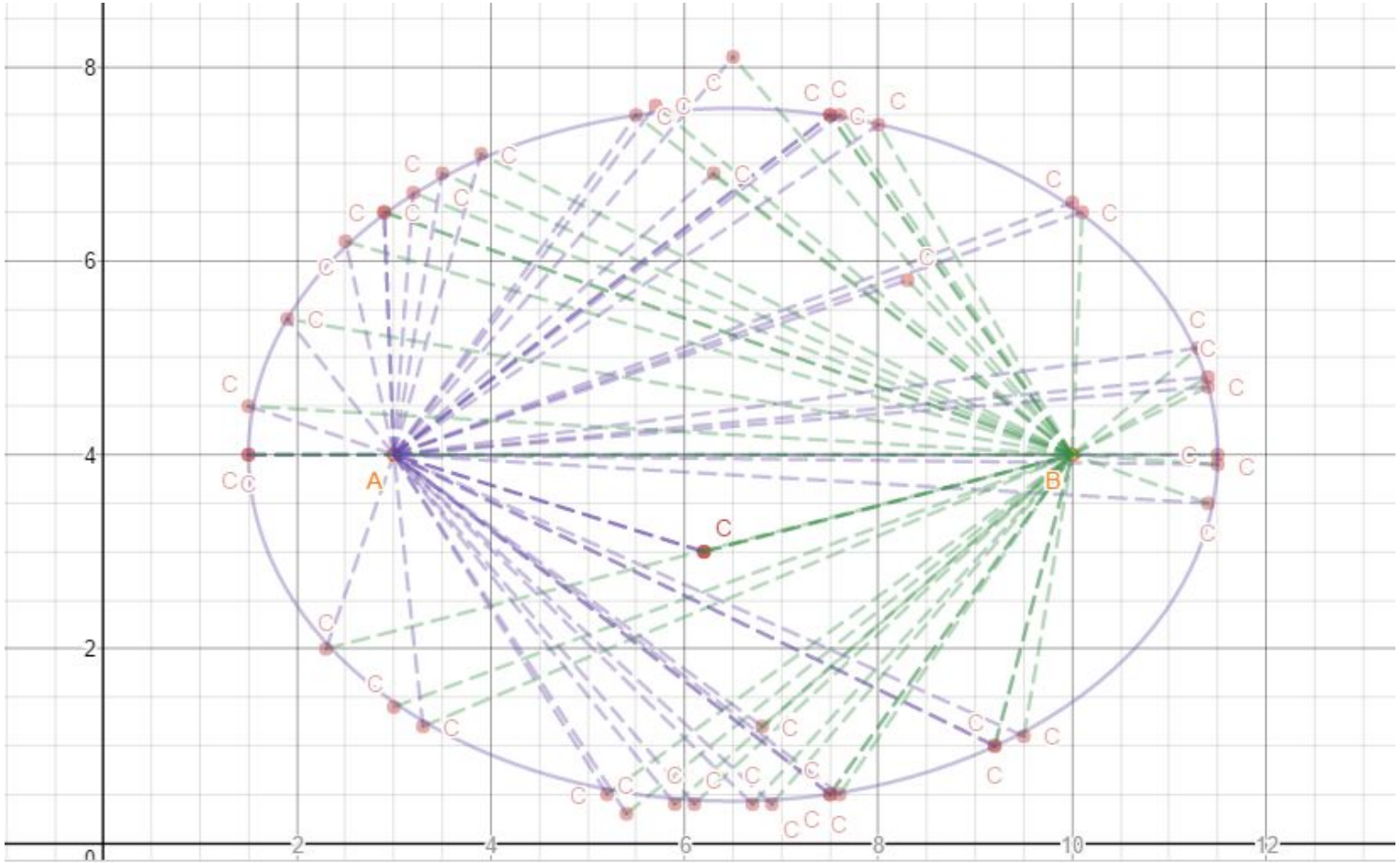

Jess

Responses Graph Overlay

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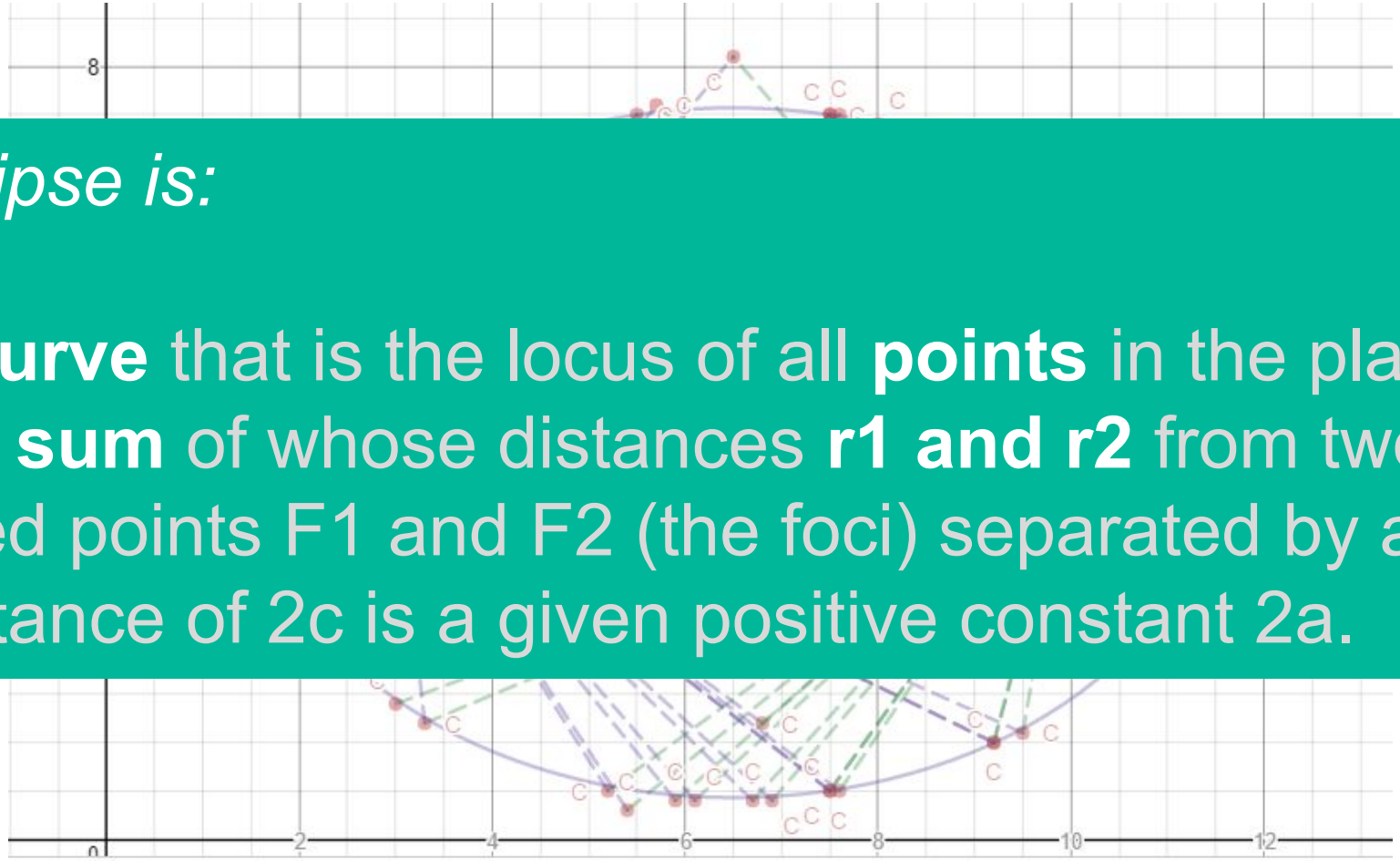


An ellipse is:

- **a curve** that is the locus of all **points** in the plane the **sum** of whose distances **r1 and r2** from two fixed points F1 and F2 (the foci) separated by a distance of 2c is a given positive constant 2a.

MAKEOVER 2 - Properties / Vocab

Developing Formulas for Triangles and Quadrilaterals

Why learn this?

You can use formulas for area to help solve puzzles such as the tangram.

A tangram is an ancient Chinese puzzle made from a square. The pieces can be rearranged to form many different shapes. The area of a figure made with all the pieces is the sum of the areas of the pieces.

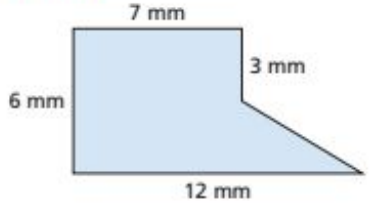
Postulate 9-1-1 Area Addition Postulate

The area of a region is equal to the sum of the areas of its nonoverlapping parts.

PRACTICE AND PROBLEM SOLVING

Multi-Step Find the shaded area. Round to the nearest tenth, if necessary.

9.



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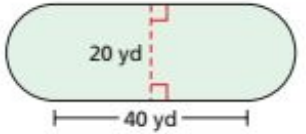
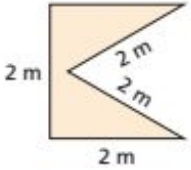


11.



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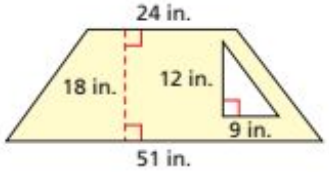

MAKEOVER 2 - Properties / Vocab

Type	Properties
Parallelogram 	• Opposite sides are equal and parallel • Opposite angles are equal
Rectangle 	• Opposite sides are equal and parallel • All angles are right angles (90°)
Square 	• Opposite sides are parallel • All sides are equal • All angles are right angles (90°)
Rhombus 	• Opposite sides are parallel • All sides are equal • Opposite angles are equal • Diagonals bisect each other at right angles (90°)
Trapezoid 	• One pair of opposite sides is parallel
Kite 	• Two pairs of adjacent sides are equal • One pair of opposite sides are equal • One diagonal bisects the other • Diagonals intersect at right angle (90°)

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Property	Parallelogram	Rhombus	Rectangle	Square
All sides are congruent		✓		✓
Opposite sides are congruent	✓	✓	✓	✓
Opposite sides parallel	✓	✓	✓	✓
Opposite angles are congruent	✓	✓	✓	✓
All angles are right angles			✓	✓
Diagonals bisect each other	✓	✓	✓	✓
Diagonals are congruent			✓	✓
Diagonals are perpendicular		✓		✓
Each diagonal bisects opposite angles		✓		✓
Consecutive angles are supplementary	✓	✓	✓	✓

MAKEOVER 2 - Properties / Vocab

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Diagonals bisect each other	✓	✓	✓	✓
Diagonals are congruent			✓	✓
Diagonals are perpendicular		✓		✓
Each diagonal bisects opposite angles		✓		✓
Consecutive angles are supplementary	✓	✓	✓	✓

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and type in:

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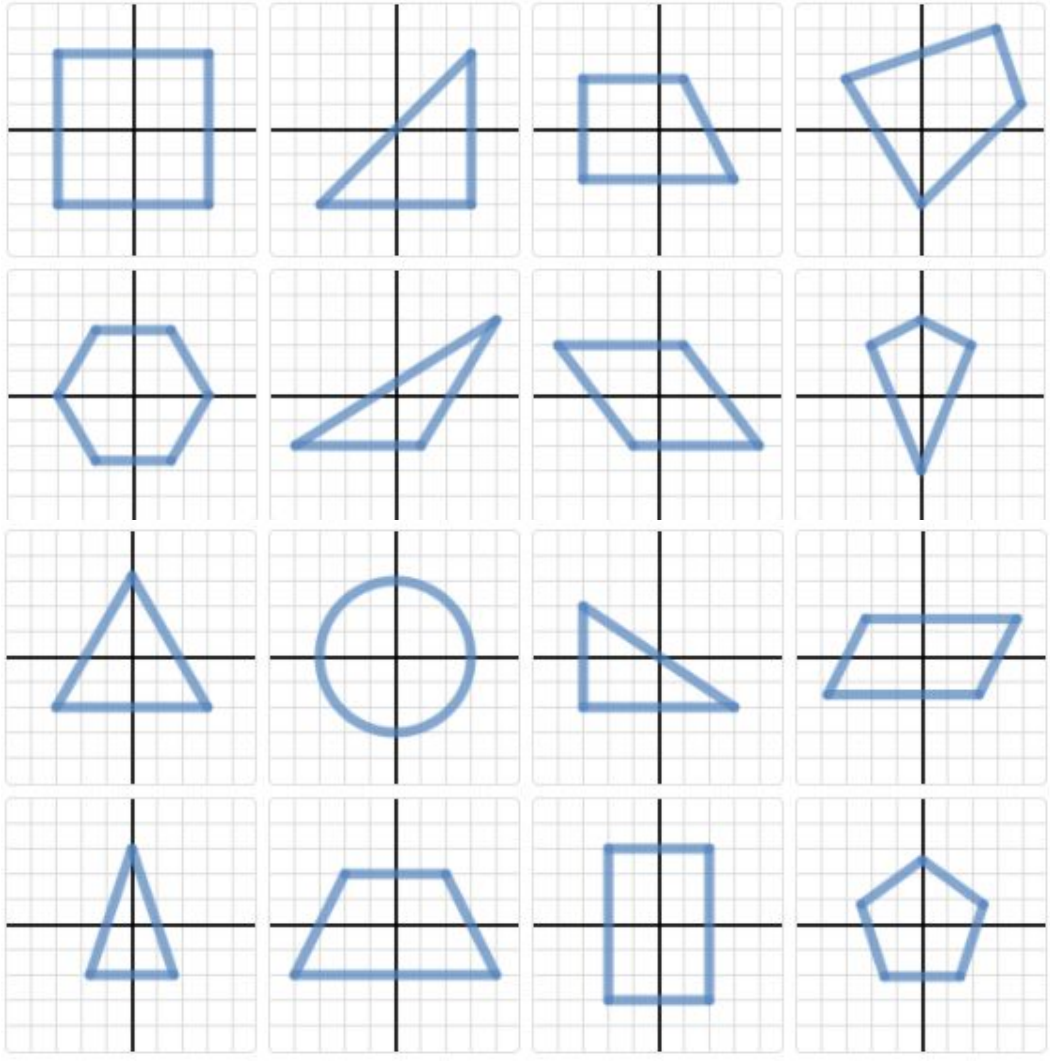


Be *right* and *wrong*, in *interesting* ways

PICKER
Math Maestro

GUESSER
Crystal Davis

Does your scatterplot form nearly a solid line?
Do your points seem to have a positive slope?
Do your points seem to have a negative slope?
Is your points a strong correlation?

PICKER
Mj

GUESSER
Jake Read

Do your points more often touch or do they more often remain distinct?
Do your points follow a positive or negative slope?
Does your graph display a positive slope?
Do a majority of your points touch?

PICKER
Dave

GUESSER
Amber

Does your graph have four sides?
Is your graph a triangle?
Does your graph have edges?
Does your graph have 5 sides?

PICKER
Darren Alcala

GUESSER
Kimberly Wells

Does your graph have a quadrilateral?
Does your graph have four equal sides
Is your graph a rectangle?
Is your graph a polygon?

MAKEOVER 2 - Properties / Vocab

Know it! Note

Integer Exponents

WORDS	NUMBERS	ALGEBRA
Zero exponent—Any nonzero number raised to the zero power is 1.	$3^0 = 1 \quad 123^0 = 1$ $(-16)^0 = 1 \quad \left(\frac{3}{7}\right)^0 = 1$	If $x \neq 0$, then $x^0 = 1$.
Negative exponent—A nonzero number raised to a negative exponent is equal to 1 divided by that number raised to the opposite (positive) exponent.	$3^{-2} = \frac{1}{3^2} = \frac{1}{9}$ $2^{-4} = \frac{1}{2^4} = \frac{1}{16}$	If $x \neq 0$ and n is an integer, then $x^{-n} = \frac{1}{x^n}$.

Reading Math

2^{-4} is read "2 to the negative fourth power."

Know it! Note

Simplifying Exponential Expressions

An exponential expression is completely simplified if...

- There are no negative exponents.
- The same base does not appear more than once in a product or quotient.
- No powers are raised to powers.
- No products are raised to powers.
- No quotients are raised to powers.
- Numerical coefficients in a quotient do not have any common factor other than 1.

Examples	Nonexamples
$\frac{b}{a} \quad x^3 \quad z^{12} \quad a^4b^4 \quad \frac{s^5}{t^5} \quad \frac{5a^2}{2b}$	$a^{-2}ba \quad x \cdot x^2 \quad (z^3)^4 \quad (ab)^4 \quad \left(\frac{s}{t}\right)^5 \quad \frac{10a^2}{4b}$

Products of powers with the same base can be found by writing each power as repeated multiplication.

$$a^m \cdot a^n = \underbrace{(a \cdot a \cdot \ldots \cdot a)}_{m \text{ factors}} \cdot \underbrace{(a \cdot a \cdot \ldots \cdot a)}_{n \text{ factors}}$$

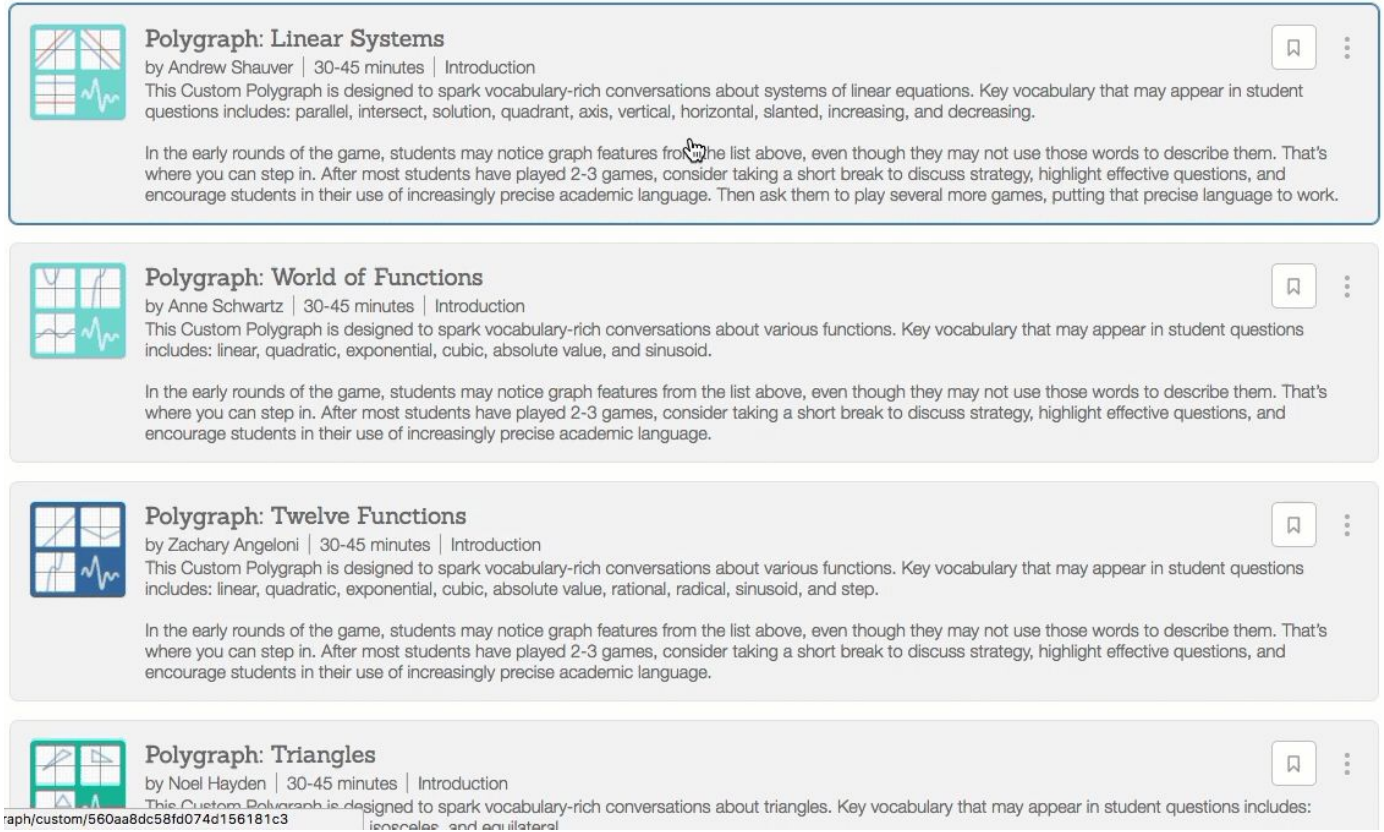
$$= \underbrace{a \cdot a \cdot \ldots \cdot a}_{m+n \text{ factors}} = a^{m+n}$$

Know it! Note

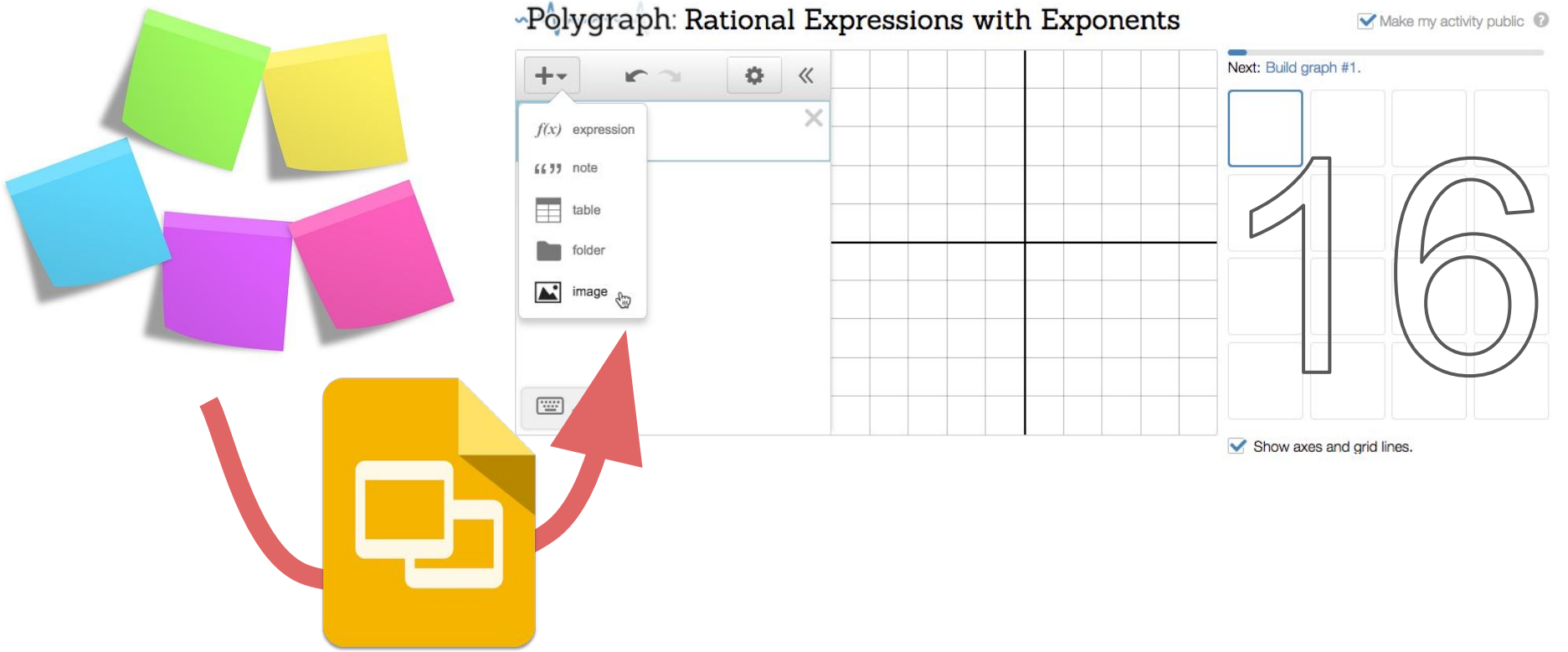
Product of Powers Property

WORDS	NUMBERS	ALGEBRA
The product of two powers with the same base equals that base raised to the sum of the exponents.	$6^7 \cdot 6^4 = 6^{7+4} = 6^{11}$	If a is any nonzero real number and m and n are integers, then $a^m \cdot a^n = a^{m+n}$.

Polygraph - browse and find



Polygraph - create your own



Makeover 3 - Everything

How To

What's Possible

Where to Learn More

Engage with us

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Michael Fenton
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Follow up: *Reflection Cove 1* 11am-12pm

Engage with us

Follow up:

Reflection Cove 1

11am-12pm

Follow up: *Reflection Cove 1* 11am-12pm