

How many polygons can you create with an area of 4 square units?

What is a Polygon?

A closed plane figure made up of several line segments that are joined together. The sides do not cross each other. Exactly two sides meet at every vertex.

Polygon Names

Generally accepted names

SidesName

n	N-gon
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
10	Decagon
12	Dodecagon

Names for other polygons have been proposed.

SidesName

9	Nonagon, Enneagon
11	Undecagon, Hendecagon
13	Tridecagon, Triskaidecagon
14	Tetradecagon, Tetrakaidecagon
15	Pentadecagon, Pentakaidecagon
16	Hexadecagon, Hexakaidecagon
17	Heptadecagon, Heptakaidecagon
18	Octadecagon, Octakaidecagon
19	Enneadecagon, Enneakaidecagon
20	Icosagon
30	Triacantagon
40	Tetracontagon
50	Pentacontagon
60	Hexacontagon
70	Heptacontagon
80	Octacontagon
90	Enneacontagon
100	Hectogon, Hecatontagon
1,000	Chiliagon
10,000	Myriagon

we also call this a right triangle because it has 1 right angle (90°)

rectangle

trapezoid


square and rectangle


parallelogram (2 sets of opposite parallel sides)

not a diamond * rhombus (4 equal sides)

also, a square

What is Area?

Area is measured in "square" units. The area of a figure is the number of squares required to cover it completely, like tiles on a floor.  = 5 square units

Area of a square = side times side. Since each side of a square is the same, it can simply be the length of one side squared. 

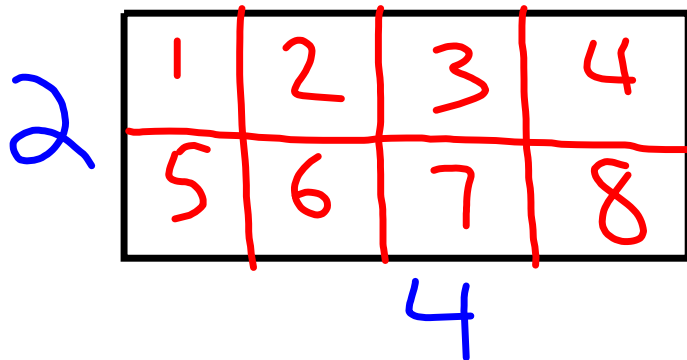
If a square has one side of 4 inches, the area would be 4 inches times 4 inches, or 16 square inches. (Square inches can also be written as in^2).

Be sure to use the same units for all measurements. You cannot multiply feet times inches, it doesn't make a square measurement.

The area of a rectangle is the length on the side times the width. If the width is 4 inches and the length is 6 feet, what is the area?

NOT CORRECT 4 times 6 = 24


CORRECT 4 inches is the same as $\frac{1}{3}$ feet. Area is $\frac{1}{3}$ feet times 6 feet = 2 square feet. (or 2 sq. ft., or 2)ft



$$2 \times 4 =$$

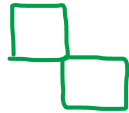
8 square units

Draw 9 different
polygons, with an area
of 4 square units

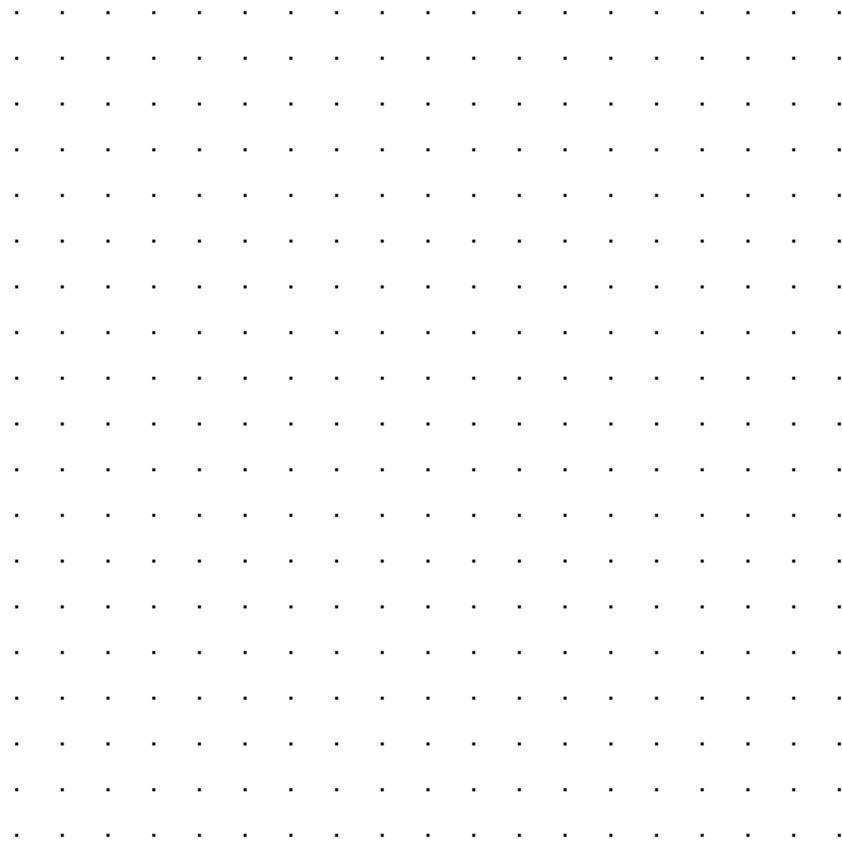
These 
are
considered
the
same
polygon:



Create 4 square unit
polygons with as many
sides as possible

*remember,  shows

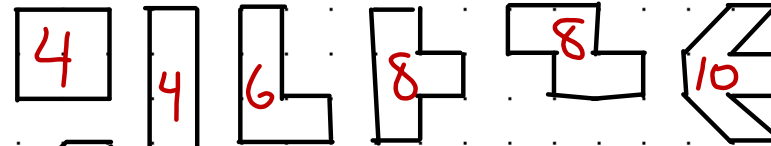
2 polygons



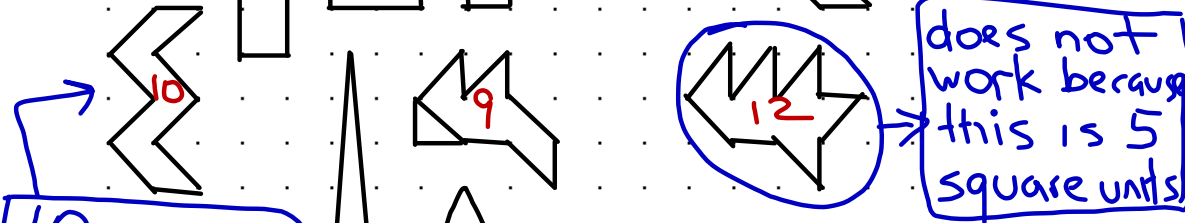
Possible solutions

* there are many more

* see the next page for the final solution!!



of
sides



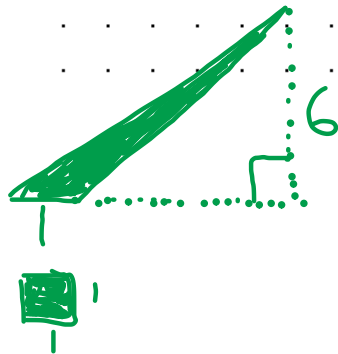
10 seems to be the greatest # of sides by connecting the dots

why does this work? the triangle has a base of 1 unit and a height of 6 units.

$$6 \times 1 = 6$$


$$6 \div 2 = 3 \text{ square units}$$


$$3 + 1 = 4 \text{ square units}$$



So far, we have been constrained (restricted) by moving from dot to dot.

* What if we could create triangles that represented (equalled) $\frac{1}{4}$ or $\frac{1}{8}$ or $\frac{1}{16}$ and so on of 1 square unit?

* each  18 sided polygon with an area of 4 square units is one quarter square unit (this figure contains 16 Δ)

 * if you could create triangles that were infinitely small, your polygon of 4 square units could have an infinite # of sides. * try your skills on the next page.

Use triangles of $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$
square units to create
4 square unit polygons with an
infinite number of sides

