Half the Rectangle!

Area of triangles and tricky polygons

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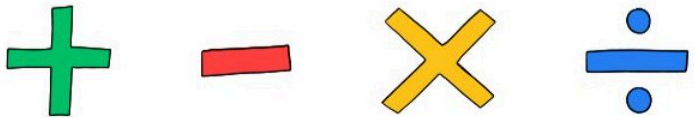
Today we will...

WE ARE LEARNING TO

- Find area of right and other triangles with 1/2 x base x height
- Find area of quadrilaterals and polygons by composing and decomposing
- Solve real-world and math problems with triangle area

SUCCESS LOOKS LIKE

- ✓ I can pick base and perpendicular height correctly
- ✓ I can explain why a triangle is half a parallelogram
- ✓ I can break a polygon into triangles and add areas



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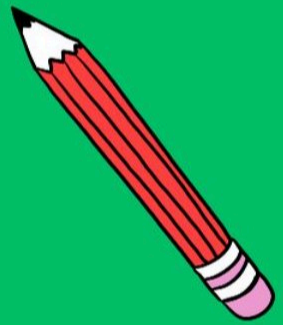
$a^2+b^2=c^2$

How to Find Triangle Area

1. Pick one side as the base
2. Find height at 90 degrees to base
3. Multiply base x height
4. Divide by 2 for triangle
5. Add or subtract parts for polygons



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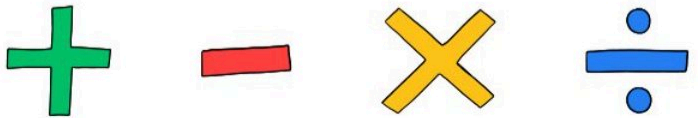
What connects to triangle area?

Triangle Area

- right triangle = half rectangle
- base times perpendicular height divided by 2
- decompose polygons into triangles
- any triangle = half parallelogram
- compose into rectangles
- square inches, square cm



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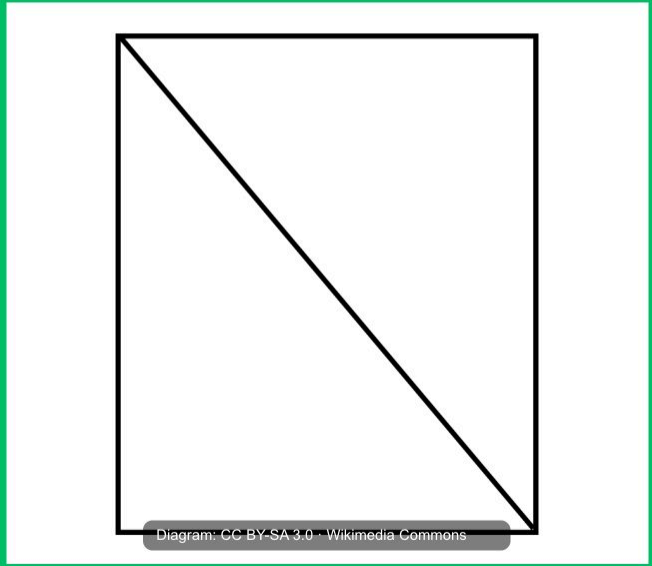
Think, pair, share

This rectangle is 8 in by 5 in. Cut corner to corner, what is each triangle area? How do you know?



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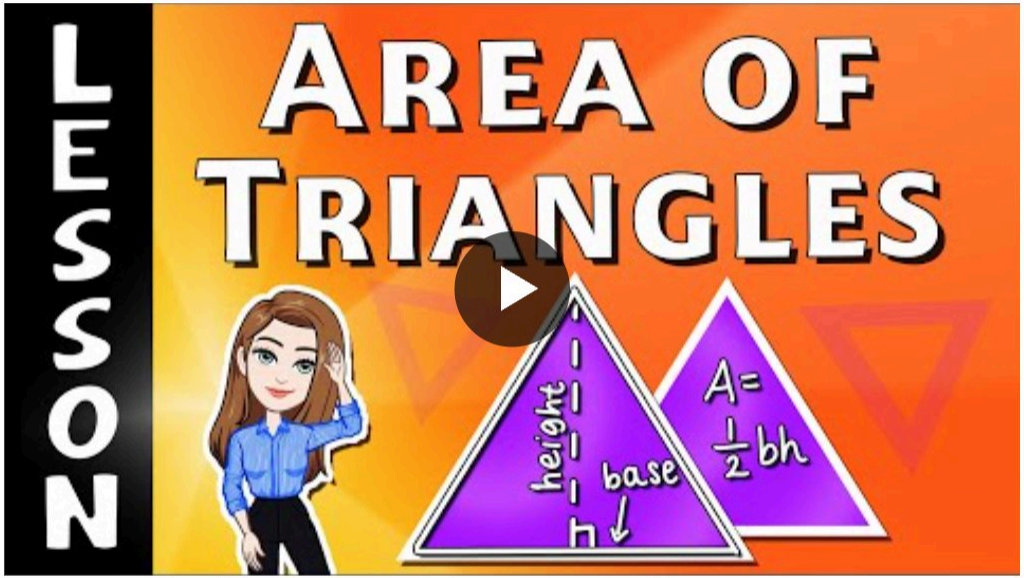
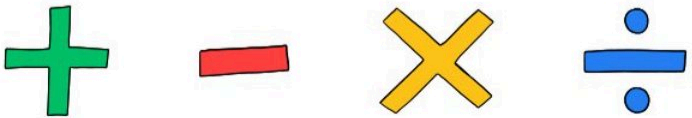
Watch: Triangle Formula in Action



▶ 0:00 – 4:50

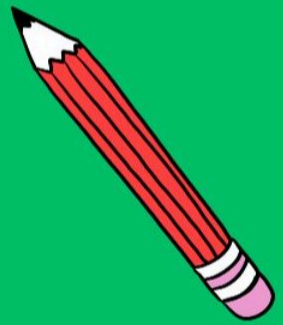
- Listen for base times height divided by 2
- Watch how two copies make a rectangle



$a^2+b^2=c^2$

Same Base, Same Height, Same Area

1. Height must hit base at 90 degrees, inside or outside
2. Any side can be base - height changes to match
3. Slanted side length is not height
4. Polygons: surround with rectangle or cut into triangles



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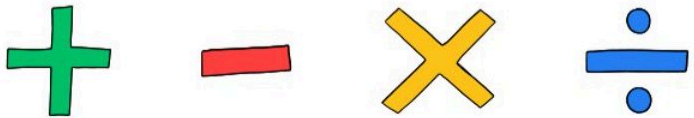
Watch: Any Kind of Triangle



▶ 0:00 – 5:00

- Spot right, acute, and obtuse examples
- Notice where height falls for leaning triangles



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$a^2+b^2=c^2$

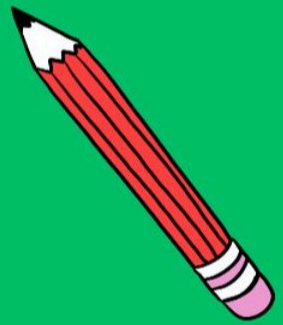
Your task

In pairs, find areas of paper triangles and a quadrilateral by composing and decomposing.

1. Measure base and perpendicular height in inches
2. Calculate 1/2 x base x height, label in square inches
3. Decompose quadrilateral into triangles, then add areas
4. Check: do two copies make the same parallelogram?

10 min

In pairs



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Key words

base

any side you measure from; height must meet it squarely

perpendicular height

straight distance from base to opposite corner at 90 degrees

compose

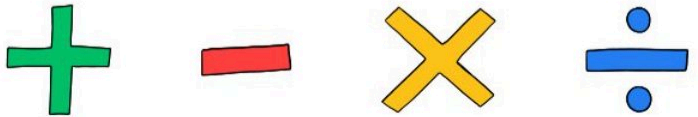
put shapes together to make a rectangle

decompose

cut a shape into triangles and smaller parts

area

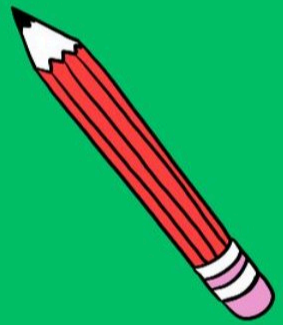
space inside a flat shape, in square units



$a^2+b^2=c^2$

What Would You Do First?

You must find paint needed for a polygon wall mural. Best first move?



A Surround it with a rectangle and subtract extra triangles

B Cut it into triangles and add their areas

C Cover it with square-inch tiles and count

Vote with your hands, then explain why.

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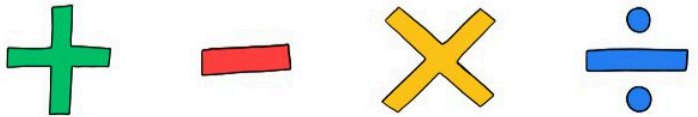
Exit ticket

1. One thing I learned today...

2. One question I still have...

3. Triangle base 10 in, height 6 in: area = ___ in2



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