Questions on 4.7 HW?

Apr 8-8:30 AM

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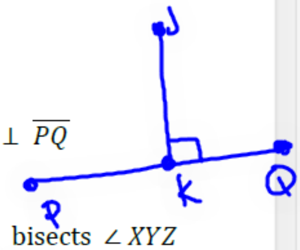
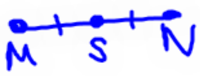
Topic: Geometric symbols

Make a sketch that matches the geometric symbols. Label your sketch appropriately.

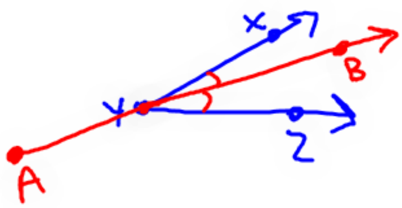
1. ΔRST
2. $\overrightarrow{AB}$
3. $\angle XYZ$
4. $\overleftrightarrow{GH}$
5. $\overline{JK} \perp \overline{PQ}$



6. Point S bisects $\overline{MN}$.



7. $\overrightarrow{AB}$ bisects $\angle XYZ$



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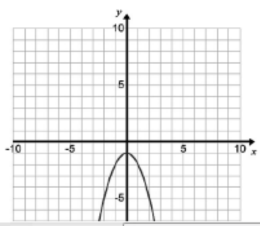
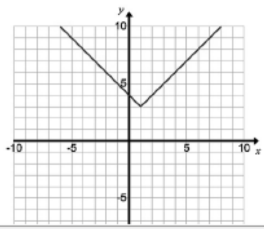
Topic: Features of functions

Find the following key features for each function:

8.

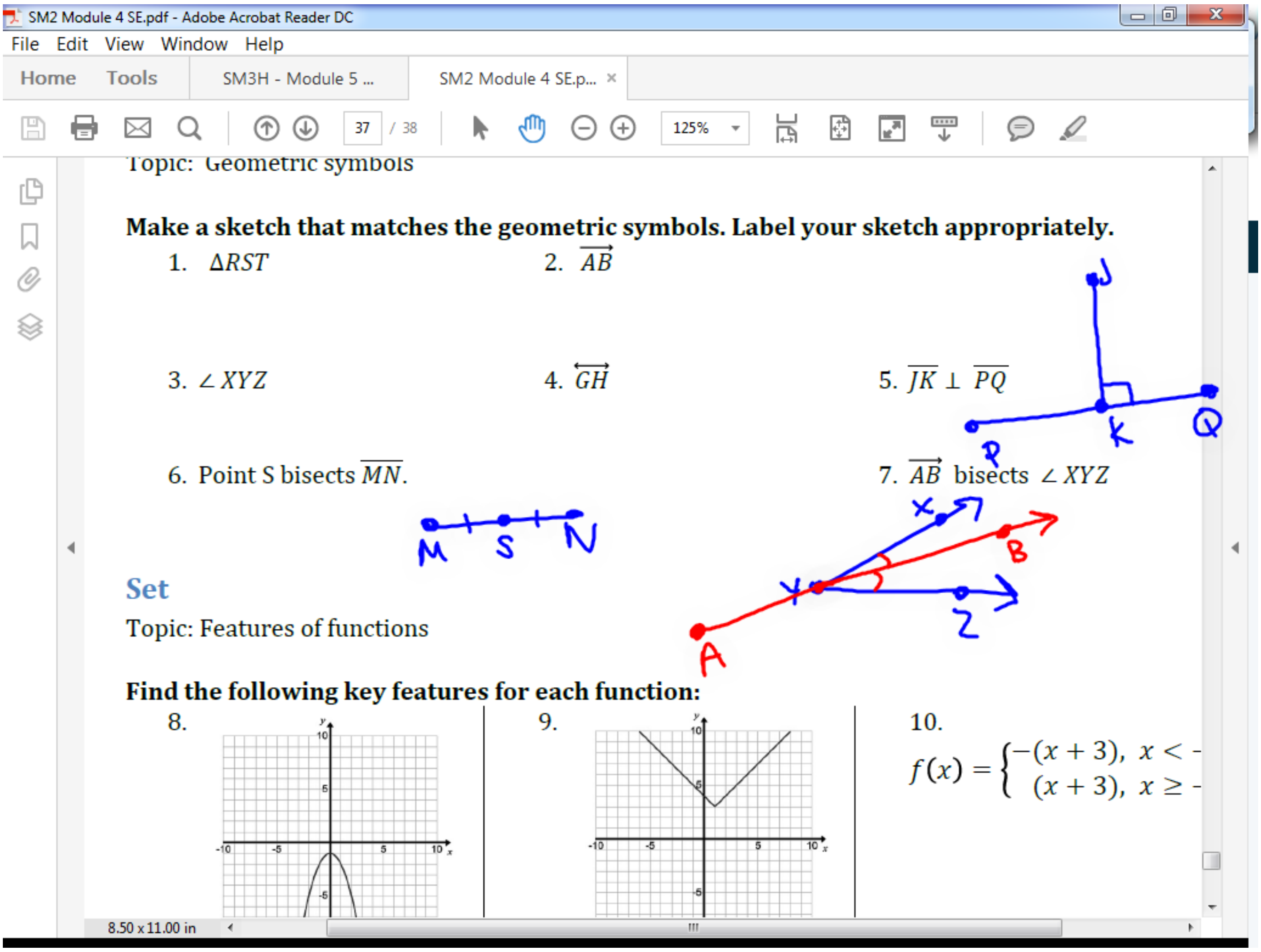


9.



10. $f(x) = \begin{cases} -(x+3), & x < - \\ (x+3), & x \geq - \end{cases}$

8.50 x 11.00 in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21. $f(x) = x^2; f^{-1}(x) =$

22. $g(x) = 2x + 4; g^{-1}(x) =$

23. $f(x) = (x+1)^2; f^{-1}(x) =$

24. $h(x)$ [y] $= \frac{1}{3}x + 6; h^{-1}(x) =$ $3(x-6)$

$y = \frac{1}{3}x + 6$

$x = \frac{1}{3}y + 6$

$-6 \qquad -6$

$\dfrac{x-6}{\frac{1}{3}} = \dfrac{\frac{1}{3}y}{\frac{1}{3}}$

$3(x-6) = y$

① switch x & y

② solve for y

25. $\boldsymbol{f(x) = \{(-3,5)(-2,-9)(-1,-2)(0,-5)(1,-4)(2,6)(3,10)(4,8)\};}$

$\boldsymbol{f^{-1}(x) =}$ {(,)(,)(,)(,)(,)(,)(,)(,)}

Write the piecewise-defined function for the following absolute value functions

26. $h(x) = |x+3|$

27. $f(x) = |x^2 - 4| + 1$

28. $g(x) = 5|x+3|$

29. $f(x) = |x^2 - 16|$

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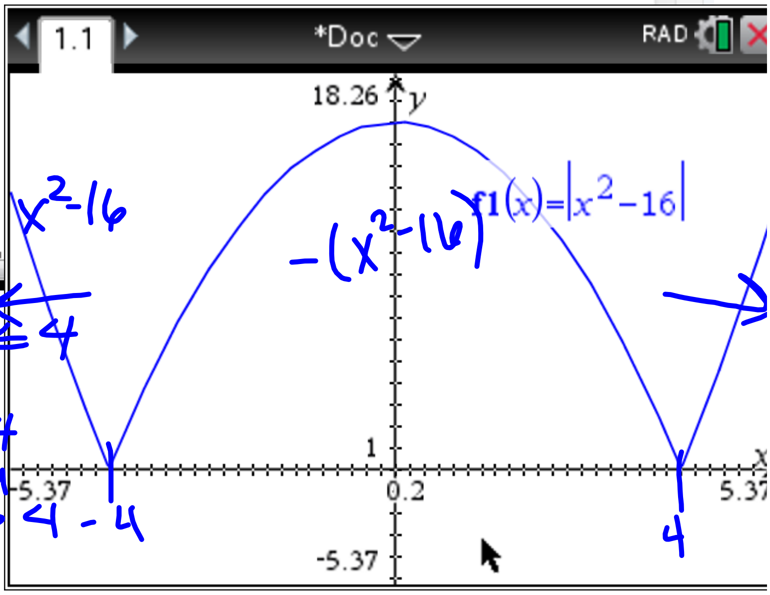


$$f(x) = \begin{cases} (x^2-16), & -4 \le x \le 4 \\ -(x^2-16), & x < -4 \text{ and } x > 4 \end{cases}$$

Jan 19-11:45 AM

5.1 How Do You Know That?

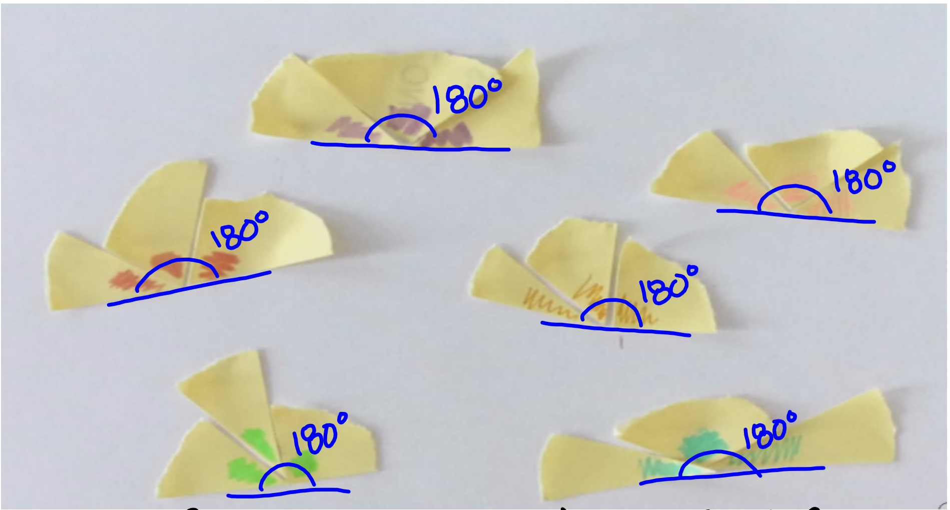
A Develop Understanding Task

You probably know that the sum of the interior angles of any triangle is 180°. (If you didn't know that, you do now!) But an important question to ask yourself is, "How do you know that?"

We know a lot of things because we *accept it on authority*—we believe what other people tell us; things such as the distance from the earth to the sun is 93,020,000 miles or that the population of the United States is growing about 1% each year. Other things are just defined to be so, such as the fact that there are 5,280 feet in a mile. Some things we accept as true based on experience or repeated experiments, such as the sun always rises in the east, or "I get grounded every time I stay out after midnight." In mathematics we have more formal ways of deciding if something is true.

Experiment #1

1. Cut out several triangles of different sizes and shapes. Tear off the three corners (angles) of the triangle and arrange the vertices so they meet at a single point, with the edges of the angles (rays) touching each other like pieces of a puzzle. What does this experiment reveal about the sum of the interior angles of the triangles you cut out, and how does it do so?



Sum of interior ∠s in a Δ equal 180°.

2. Since you and your classmates have performed this experiment with several different triangles, does it guarantee that we will observe this same result for *all* triangles? Why or why not?

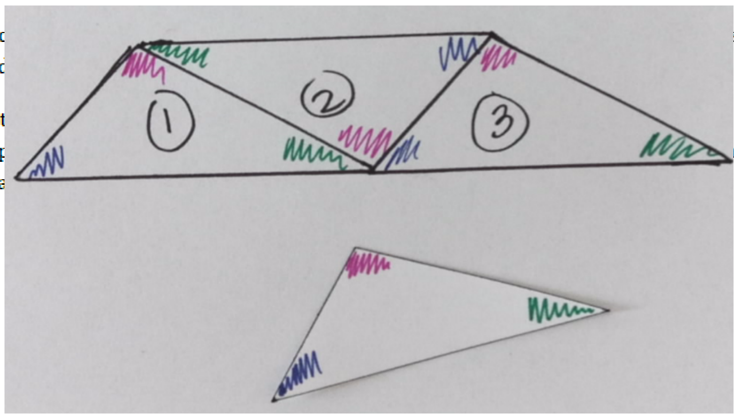
Yes, they'll all sum up to 180°.

Experiment #2

Perhaps a different experiment will be more convincing. Cut out another triangle and trace it onto a piece of paper. It will be helpful to color-code each vertex angle of the original triangle with a different color. As new images of the triangle are produced during this experiment, color-code the corresponding angles with the same colors.

Loc … s that form the
end …

Rot … triangle onto your
pap … age/pre-image pairs
of a …



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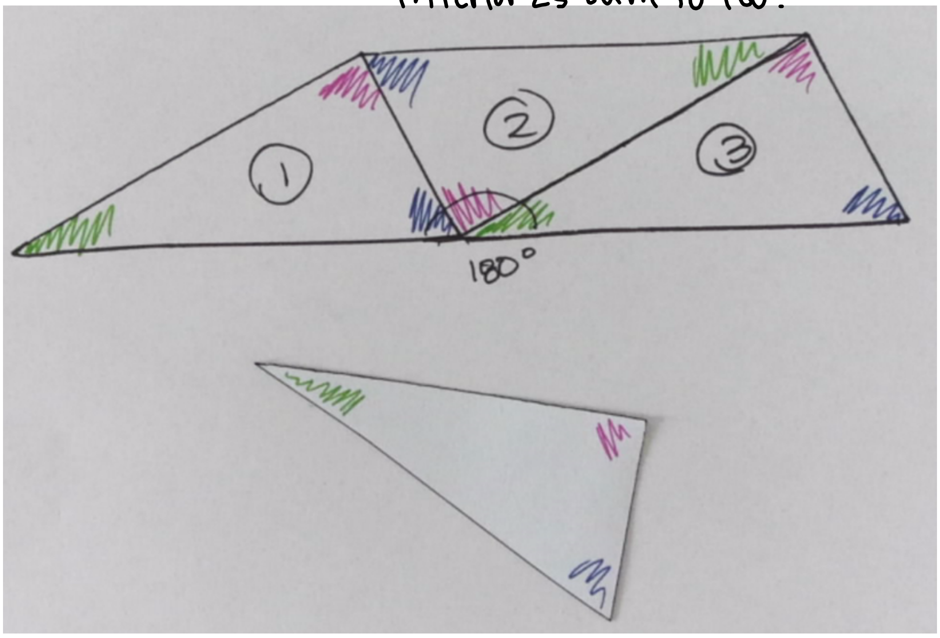
Now rotate the new "image" triangle 180° about the midpoint of one of the other two sides. Trace the new triangle onto your paper and color-code the angles of this new image triangle so that corresponding image/pre-image pairs of angles are the same color.

3. What does this experiment reveal about the sum of the interior angles of the triangles you cut out, and how does it do so? Interior ∠s sum to 180°.

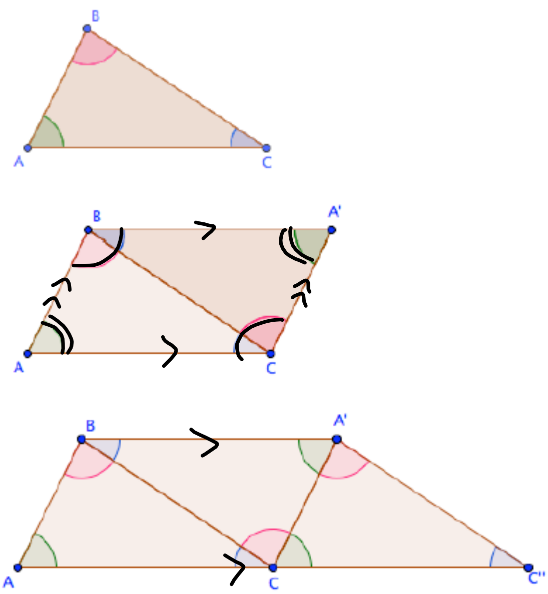


4. Do you think you can rotate *all* triangles in the same way about the midpoints of its sides, and get the same results? Why or why not?

Yes.

Examining the Diagram

Experiment #2 produced a sequence of triangles, as illustrated in the following diagram.



Here are some interesting questions we might ask about this diagram:

5. Will the second figure in the sequence always be a parallelogram? Why or why not?

6. Will the last figure in the sequence always be a trapezoid? Why or why not?

Homework

Finish 5.1 "Ready, Set, Go"