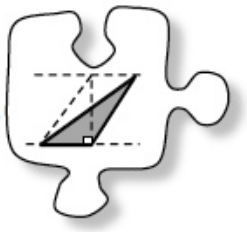
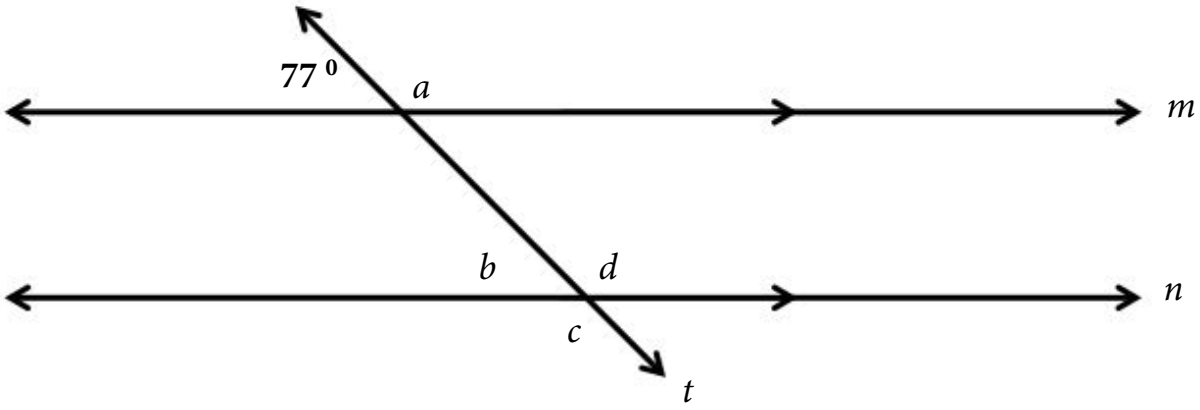
Name:_____ Period:_____ Date:_____

2.2.2 How can I find the area?

Areas of Triangles and Composite Shapes



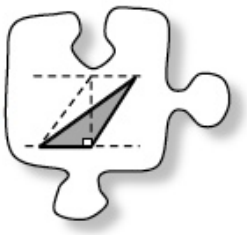
Examine the diagram below (not drawn to scale). Then use the information provided in the diagram to find the measures of angles a, b, c, and d. For each angle, name the relationship from your Angle Relationships Toolkit that helped justify your conclusion.



Angle measure:	Justification:
m∠a =	
m∠b =	
m∠c =	
m∠d =	

2.2.2 How can I find the area?

Areas of Triangles and Composite Shapes



How much grass would it take to cover a football field? How much paint would it take to cover a stop sign? How many sequins does it take to cover a dress? Finding the area of different types of shapes enables us to answer many questions. However, different people will see a shape differently. Therefore, during this lesson, be especially careful to look for different strategies that can be used to find area.

As you solve these problems, ask yourself the following focus questions:

What shapes do I see in the diagram?

Does this problem remind me of one I have seen before?

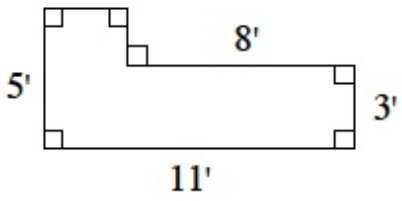
Is there another way to find the area?

2-70. STRATEGIES TO MEASURE AREA

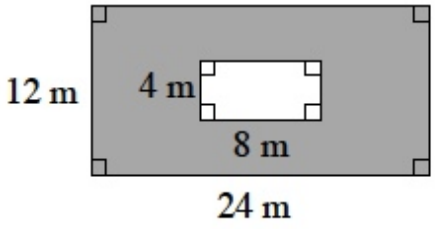
In Lesson 2.2.1 you used a grid to measure area. But what if a grid is not available? Or what if you want an exact measurement?

Examine the variety of shapes below. Work with your team to find the area of each one. If a shape has shading, then find the area of the shaded region. Be sure to listen to your teammates carefully and look for different strategies. Be prepared to share your team's method with the class.

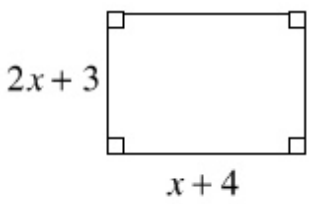
a.



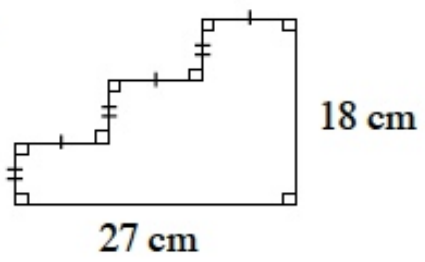
b.



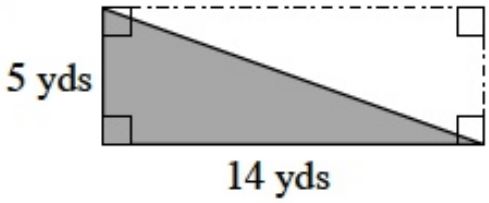
c.



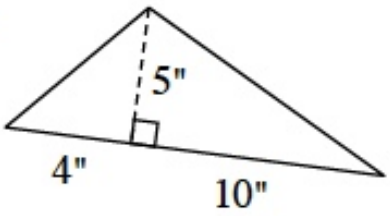
d.



e.



f.



2-71. Ismael claimed that he did not need to calculate the area for part (f) in problem 2−70 because it must be the same as the area for the triangle in part (e). Explore with either of the following tools: Area of a Triangle (Html5) or *Area of Triangles* (Flash).

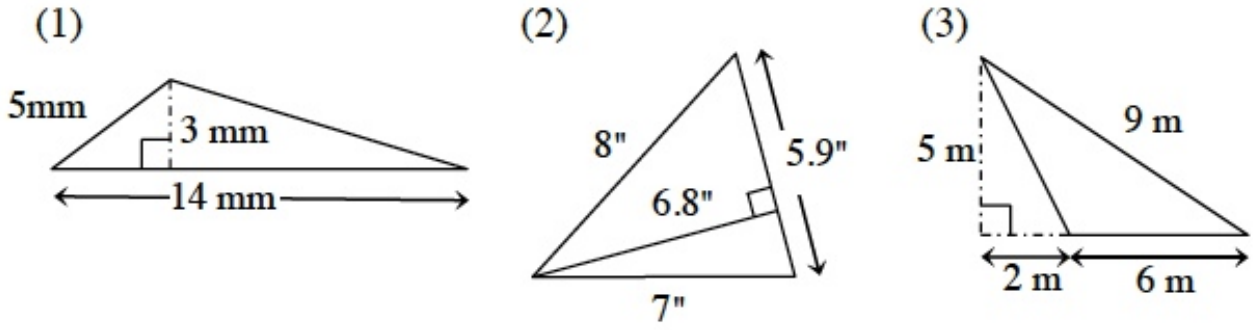
a. Is Ismael's claim correct? How do you know? Draw diagrams that show your thinking.

b. Do all triangles with the same bases and heights have the same areas? Use your dynamic geometry tool to investigate. If no technology is available, obtain the Lesson 2.2.2 Resource Page and compare the areas of the given triangles.

c. Explain why the area of any triangle is half the area of a rectangle that has the same base and height. That is, show that the area of a triangle must be $A=\frac{1}{2}bh$.

2-72. How do you know which dimensions to use when finding the area of a triangle?

a. Copy each triangle below onto your paper. Then find the area of each triangle. Draw any lines on the diagram that will help. Turning the triangles may help you discover a way to find their areas.



b. Look back at your work from part (a). Which numbers from each triangle did you use to find the area? For instance, in the center triangle, you probably used only the 6.8" and 5.9". Write an explanation and/or draw a diagram that would help another student understand how to choose which lengths to use when calculating the area.

c. Mario, Raquel, and Jocelyn are arguing about where the height is for the triangle below. The three have written their names along the part they think should be the height. Determine which person is correct. Explain why the one you chose is correct and why the other two are incorrect.