

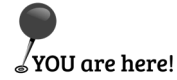
Name _____ Per _____

LO: I can define area, find area, and explain dissection it relates to area and volume.

DO NOW On the back of this packet

(1) **What do we mean by "3D" or "3-dimensional?"**
calculator

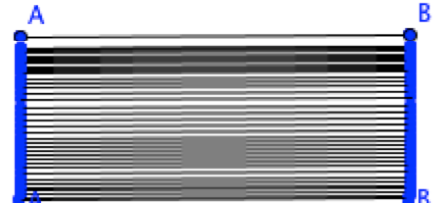
A point has no measure because a point represents a _____



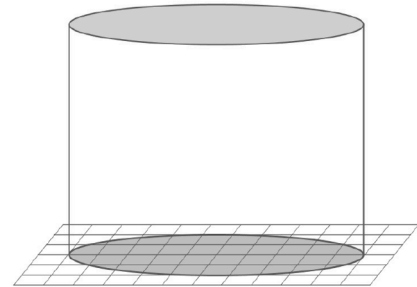
"Dragging" a point in one direction results in a _____ or _____ which has a measure of _____



"Dragging" a line across a surface results in a region which has a measure of _____



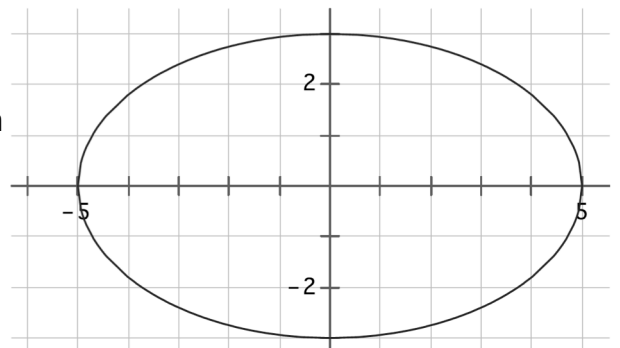
"Dragging" a region off of a plane results in a solid which has a measure of _____



(2) **What is area?**

(a) **Area** is a measurement that allows us to quantify 2-dimensional regions. The two dimensions can be seen in the diagram below. Units can be measured in the _____ direction and the _____ direction. The quantity of area of a square region bound by 1 x-unit and 1 y-unit is equal to 1 square unit.

(b) Refer to the figure on the graph at right. It takes one can of paint to cover a square unit in the coordinate plane. How many cans of paint are needed to paint the region within the curved figure?

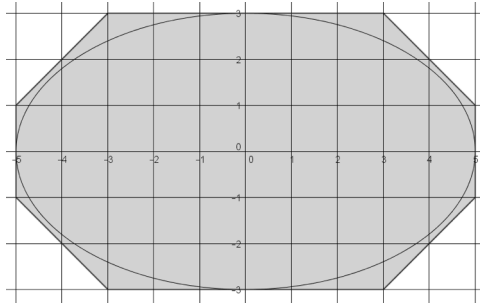
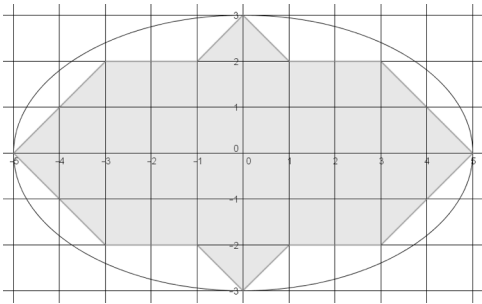


(3) How does the idea of dissection help us?

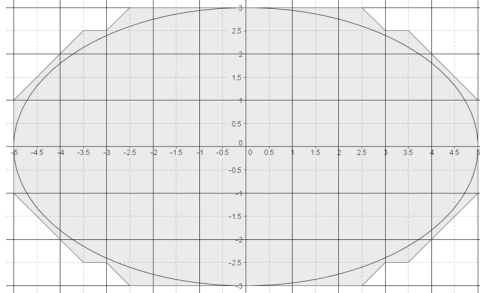
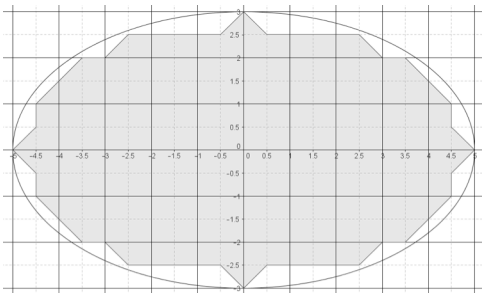
cont.
calculator

(c) How do the pair of diagrams below help?

Make a conclusion about the area of the original shape based on these two shaded areas.



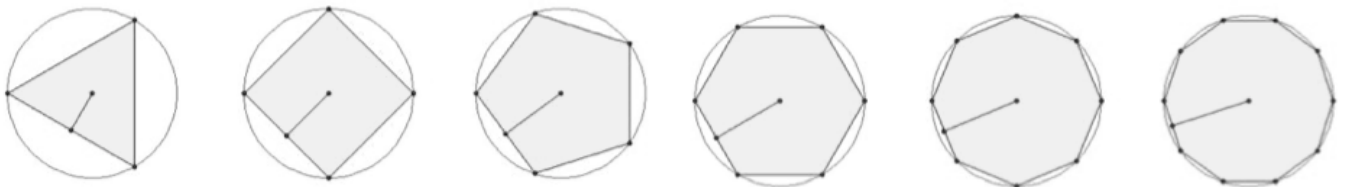
(d) How do the pair of diagrams below help us improve our conclusion from the last pair of diagrams?



(e) What if we continue using a smaller and smaller grid? Can we **squeeze** the area out of squares on a grid by reaching a limit?

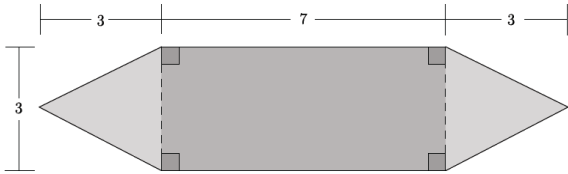
(4) Where does the area formula for circles come from?

The circumference and area of a circle can also be found by reaching a limit. As the polygons have more sides, the perimeter of the polygon gets closer to the _____ of the circle and the area of the polygon gets closer to the _____ of the circle.

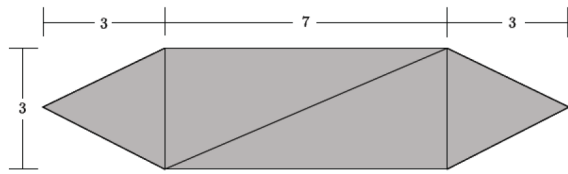


(5) **Dissection into triangles**
calculator

(a) Dissect the shape below into 3 basic shapes and use the area formulas on your reference sheet (the back of 8.0) to calculate the area of the shaded region below.

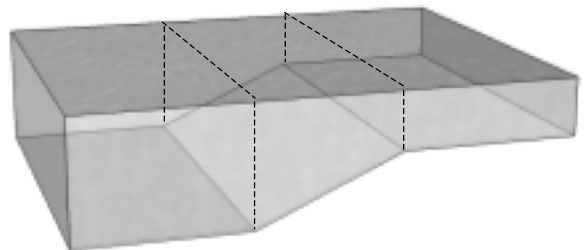
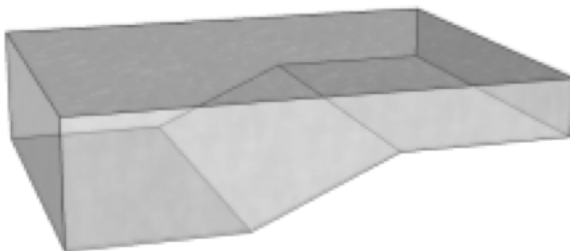


(a) Will you get the same result by finding the areas of the triangles as shown below.



(c) **Summary for area dissection:** The sum of the areas of all non-overlapping regions within a larger region is equal to the area of the larger region. Any polygonal region can be dissected into triangles. Draw a different polygonal region below and show how it can be divided into triangles.

(d) Dissection can also be applied to volumes – we can break the large solid up into smaller solids. Highlight the three sections with three different colors.



DO NOW visual answer



(8)
calculator

Exit Ticket

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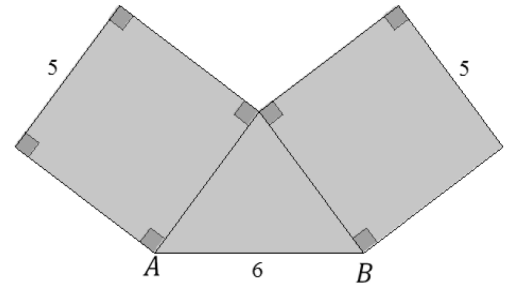
(9)
calculator

Homework

Provide sufficient evidence for each response.

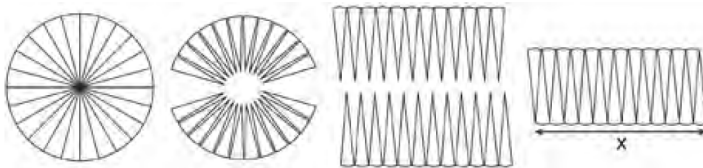
(1)

Two squares with side length 5 meet at a vertex and together with segment AB form a triangle with base 6 as shown. Find the area of the shaded region.



(2)

A circle with a radius of 5 was divided into 24 congruent sectors. The sectors were then rearranged, as shown in the diagram below.



To the *nearest integer*, the value of x is

- 1 31
- 2 16
- 3 12
- 4 10

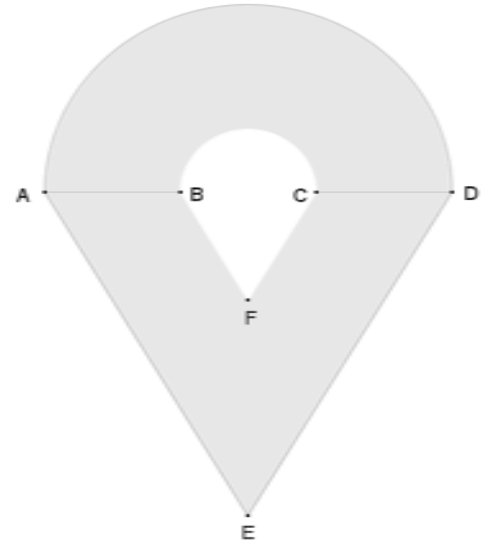
(9)
calculator

Homework

Provide sufficient evidence for each response.

(3)

The figure shown is composed of a semicircle and a non-overlapping equilateral triangle, and contains a hole that is also composed of a semicircle and a non-overlapping equilateral triangle. If the radius of the larger semicircle is 8, and the radius of the smaller semicircle is $\frac{1}{3}$ that of the larger semicircle, find the area of the figure.



(9)
calculator

Homework

Provide sufficient evidence for each response.

(4) BONUS

Four congruent right triangles with leg lengths a and b and hypotenuse length c are used to enclose the green region in Figure 1 with a square and then are rearranged inside the square leaving the green region in Figure 2.

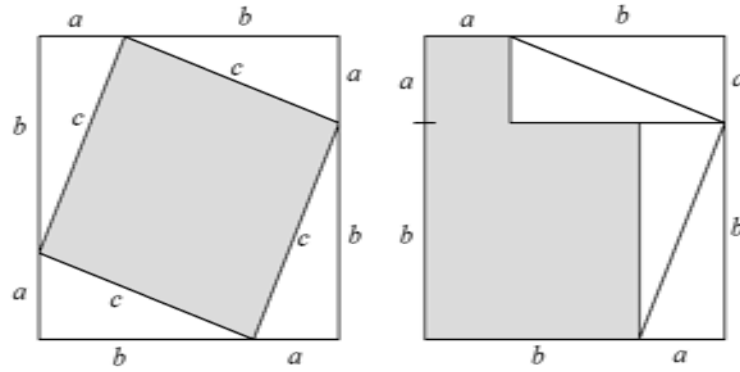


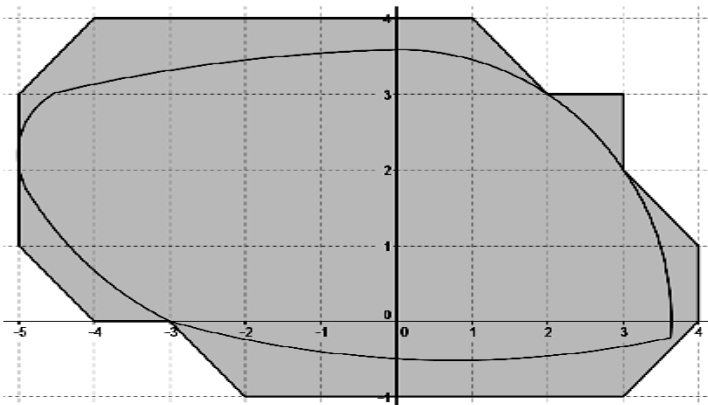
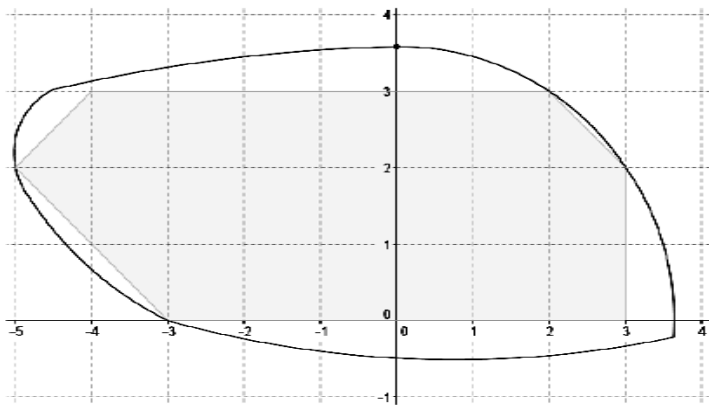
Figure 1

Figure 2

- Use Property 4 to explain why the green region in Figure 1 has the same area as the green region in Figure 2.
- Show that the green region in Figure 1 is a square and compute its area.
- Show that the green region in Figure 2 is the union of two non-overlapping squares and compute its area.
- How does this prove the Pythagorean theorem?

(1) The LO (Learning Outcomes) are written below your name on the front of this packet. Demonstrate your achievement of these outcomes by doing the following:

(1) Explain how to use the shaded polygonal regions shown to estimate the area A inside the curve



(2) Use Problem 1 to find an average estimate for the area inside the curve.

(1) Which shape below has the most area? Why do you think so?



(2) Both images below are made out of the same 4 shapes.
How can the first one have a gap and the second one not have a gap?

