

MATHCOUNTS[®] Problem of the Week Archive

MATHCOUNTS Valentine – February 11, 2019

Problems

On some graph paper, graph the following segments:

$$y = x, \text{ for } 0 \leq x \leq 2$$

$$y = 2x - 2, \text{ for } 2 \leq x \leq 3$$

$$x = 3, \text{ for } 4 \leq y \leq 6$$

$$y = -x + 9, \text{ for } 2 \leq x \leq 3$$

$$y = 7, \text{ for } 1 \leq x \leq 2$$

$$y = x + 6, \text{ for } 0 \leq x \leq 1$$

Now reflect each of the segments over the y -axis. What popular shape have you drawn?

What is the area of the region you have enclosed with this Valentine shape?

If you were to perform a dilation of the complete enclosed region about the point $(0, 4)$ with a scale factor of 2, what would be the area of this new shape?