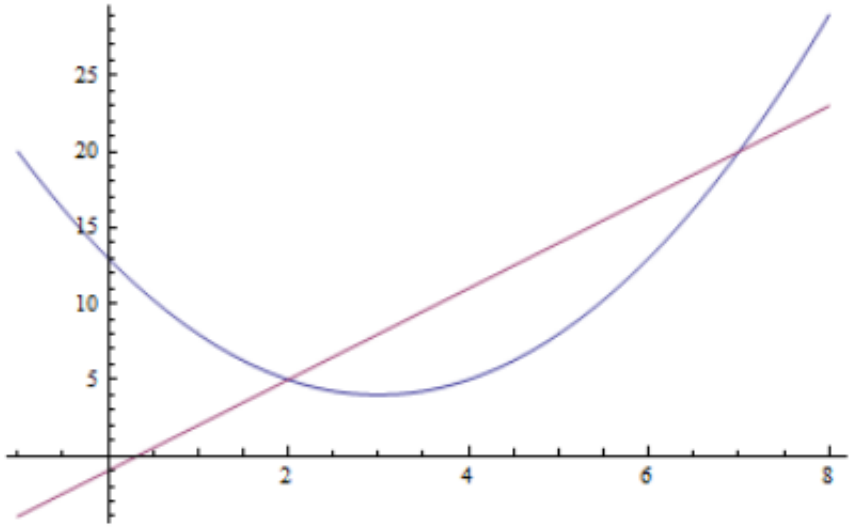
# Recitation # 4: Volume by Shells & Length of Curves

## Group work:

**Problem 1** *Set up an integral that will compute the volume of the solid generated by revolving the region bounded by the curves* $y = x^2 - 6x + 13$ *(i.e.* $x = 3 \pm \sqrt{y-4}$*) and* $y = 3x - 1$ *about:*




*Use both the washer method as well as the shell method for each problem. Which method would you prefer for each problem? Why?*

(a) *the* $x$*-axis*

(b) $y = -4$

(c) $y = 22$

(d) *the* $y$*-axis*

(e) $x = -3$

(f) $x = 9$

**Problem 2** **Set up** *an integral (or a sum of integrals) to find the perimeter of the region bounded by the curves* $y = 2x^2 - 5x + 13$ *and* $y = x^2 + 6x - 11$.

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**Problem 3** *A steady wind blows a kite due west. The kite's height above the ground from horizontal position* $x = 0$ *ft. to* $x = 80$ *ft. is given by*

$$y = 150 - \frac{1}{40}(x - 50)^2.$$

*Set up the integral to find the distance traveled by the kite.*

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