Recitation # 2 Regions Between Curves

Group work:

Problem 1 *Consider the region bounded by the curves* $y = 7x^2 - 12$ *and* $y = x^2 - 6x$.

(a) *Draw a sketch of the graphs.*

(b) *Find the area between these curves.*

(c) *Find the area of the region bounded by the curves* $x = 7y^2 - 12$ *and* $x = y^2 - 6y$.

(d) *Find the area of the region bounded by the curves* $y = 7x^2$ *and* $y = x^2 - 6x + 12$.

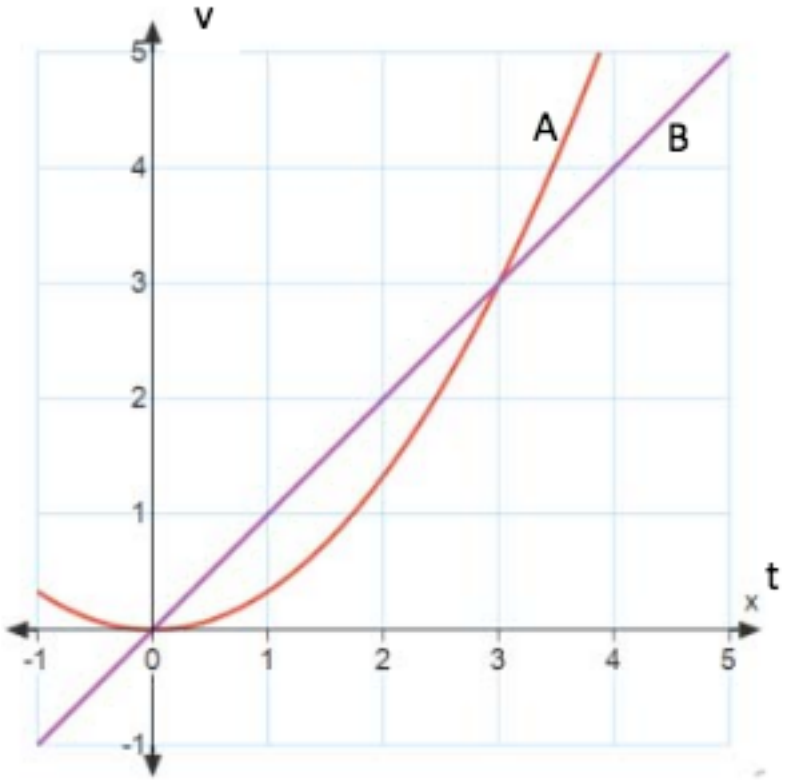
(e) *Find the area of the region bounded by the curves* $y = 7x^2 - 12$, $y = x^2 - 6x$, $x = 0$, *and* $x = 3$.

Problem 2 *Set up two different integrals that compute the area of the region bounded by the curves* $x = y^2$ *and* $y = 6 - x$ *(and be sure to draw a sketch of the graphs).*

Problem 3 *Two runners (A and B) run in a race in which the winner runs the farthest in 4 minutes. The runners' respective velocities are*

$$v_A(t) = \frac{1}{3}t^2 \qquad v_B(t) = t$$

The graphs of the runners' velocities is given below.



(a) *Who is running the fastest 2 minutes into the race?*

(b) *Who is winning the race 2 minutes into the race (and by how much)?*

(c) *What special event occurs 3 minutes into the race?*

(d) *Who wins the race (and by how much)?*