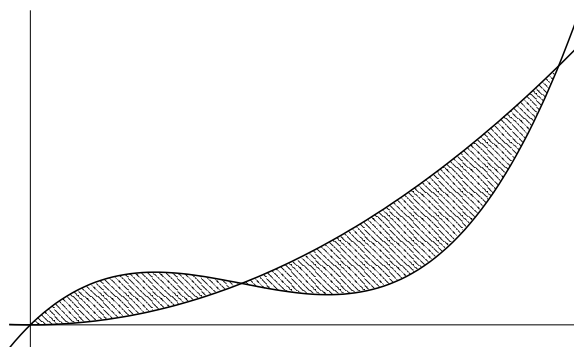4. (10 total points)  Let $\mathscr{R}$ be the region which is bounded on the left by the curve $x = \sqrt{y}$, bounded on the right by the line $y = -\dfrac{1}{2}x + 5$, and bounded below by the $x$-axis.

   (a) (5 points)  Set up a definite integral (or integrals) *with respect to x* for the area of the region $\mathscr{R}$, and evaluate your integral(s). Give your answer in exact form.

   (b) (5 points)  Set up a definite integral (or integrals) *with respect to y* for the area of the region $\mathscr{R}$, and evaluate your integral(s). Give your answer in exact form.

4 (10 points)    Compute the total area bounded
by the curves $y = x^2$ and $y = x^3 - 6x^2 + 10x$.

5. (10 total points)   Let $\mathscr{R}$ be the region in the first quadrant bounded by the curves $y = 2 + x^2$ on the right, $y = 5$ on top, and $y = 3x + 2$ on the left.

(a) (5 points) Find the area of the region $\mathscr{R}$.
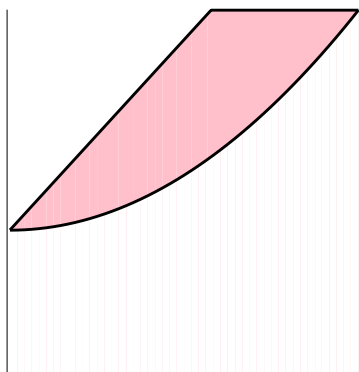


(b) (5 points) The line through $(0, 2)$ and $(b, 5)$ divides $\mathscr{R}$ into two regions of equal area. Find $b$.