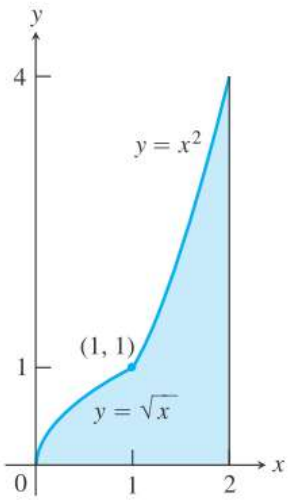
Practice Assessment Q3 #3

I-A4a

1. Find the exact area of the shaded region. Show all work.



I-U4

Let $f(x) = \int_3^{2x} 2t^2 - 3t - 2\, dt$.

2. Find $f'(x)$. Simplify your answer.

3. Find all intervals where $f(x)$ is increasing. Justify your answer.

I-U7

Suppose $f(x)$ and $h(x)$ are continuous functions such that $\int_1^9 f(x)\, dx = -1$, $\int_7^9 f(x)\, dx = 5$, $\int_7^9 h(x)\, dx = 4$.

4. $\int_9^7 [h(x) - f(x)]\, dx$

5. $\int_1^7 f(x)\, dx$

I-U5

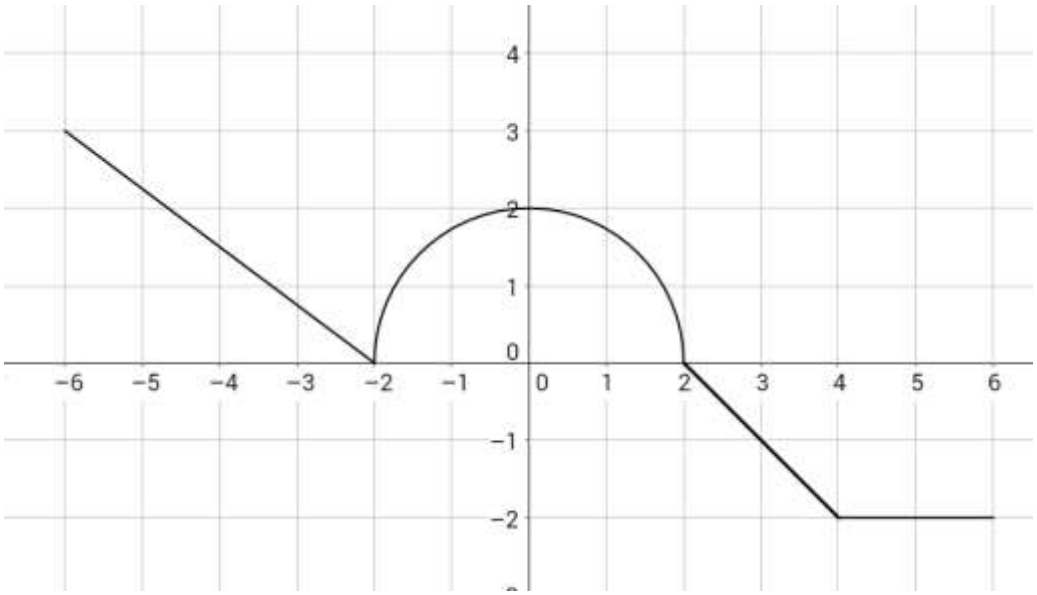
6. $\int_4^9 2x - \frac{1}{\sqrt{x}}\, dx$

7. If $\int_{-2}^{2}(x^3 + k)\, dx = 16$, then what is the value of k?

I-U9

The function $f(t)$ is shown over $[-6,6]$ and consists of line segments and a semicircle.

Let $G(x) = \int_{-6}^{x} f(t)\,dt$



8. Find $G(0)$, $G'(0)$, and $G''(0)$.

9. Find the relative maxima of $G(x)$, if any, over [-6,6]. Justify your answer.

10. Find any points of inflection of $G(x)$. Justify your answer.