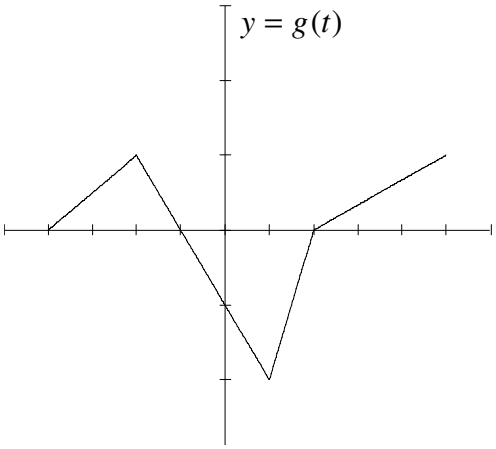
Name: _____ Investigation of the Fundemental Theorem of Calculus

Let $f(x) = \int_0^x g(t)dt$



1. How do you evaluate the *y*-values for $f(x) = \int_0^x g(t)dt$

2. Evaluate *f*(2). Use geometry.

3. Evaluate *f*(-1). Why is your answer positive?

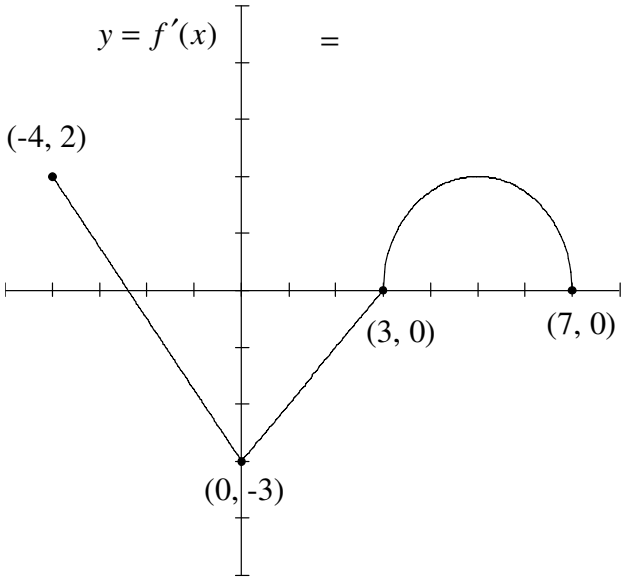
4. Find $f(5)$

5. Find $y = f'(x)$

6. What relationship do you notice between $f(x)$ and $g(t)$? Why do you think this is?

7. Evaluate $f''(-3)$. Show all work leading to your answer.

The graph of $y = f'(x)$ is given above consisting of two line segments and a semi-circle and $f(0) = 3$



8. Write an equation representing $f(x)$.

9. Find $f(3)$

10. Find $f(7)$

11. Find $f(-4)$

12. For $-4 \le x \le 7$, find the intervals over which $f(x)$ is increasing. Justify your answer.

13. For $-4 \le x \le 7$, find the intervals over which $f(x)$ is decreasing. Justify your answer.

14. Where does $f(x)$ have a relative minimum? Justify your answer.

15. Where is $f(x)$ concave down? Justify your answer.

16. What are the *x*-values for the points of inflection for $f(x)$? Justify your answer.