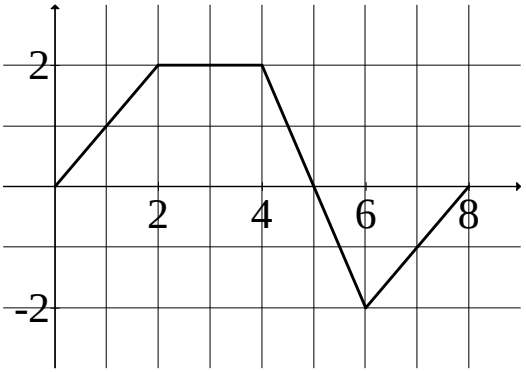
Calculus AB
Skills Check FTC Day 2
Non Calculator

Name _____

1. Let f be the piecewise linear function graphed below, for $0 \le x \le 8$.

What is the value of $\int_0^6 f(x)\,dx$?

A) 6
B) 4
C) 13
D) 8
E) 1



Use this graph for Problems 1-3.

2. Using the above graph, what is $\int_0^6 [f(x)+1]\,dx$?

3. If g(x) = $\int_3^x f(t)\,dt$, find

A) g(5) B) g′(5) C) g″(5)

Evaluate the Definite Integral. You must show all steps.

4. $\int_{-1}^{2} (3t^2 - 1)\,dt$

5. $\int_{-2}^{1} 6x\,dx$

6. $\int_1^4 \left(-\frac{4}{x^2} + 2 \right) dx$

7. $\int_1^9 \frac{x^2 + 2\sqrt{x}}{x} dx$

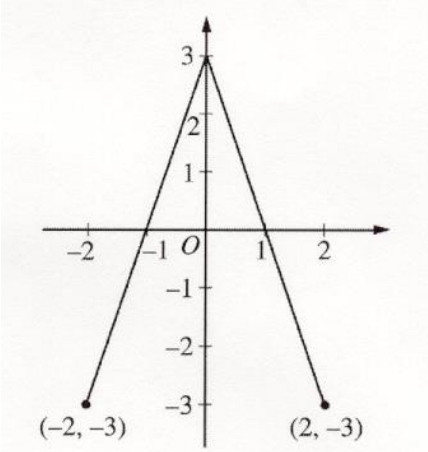
8. $\int_0^{\frac{\pi}{3}} \sec^2 x dx$

9. $\int_{-2}^{2} |x - 1| dx$

10. Use the Second Fundamental Theorem of Calculus to find F ’(x).

$F(x) = \int_{x^2}^{-2} \frac{t}{t^2 + 1} dt$

12.



Graph of f

The graph of the function f shown above consists of two lines segments. Let g be the function given by $g(x) = \int_0^x f(t)\,dt$.

(a) Find $g(-1)$, $g'(-1)$, and $g''(-1)$.

(b) For what values of x in the open interval $(-2,2)$ is g increasing? Explain your reasoning.

(c) For what values of x in the open interval $(-2,2)$ is the graph of g concave down? Explain your reasoning.

(d) Write the equation of the line tangent to g(x) at x = -1.