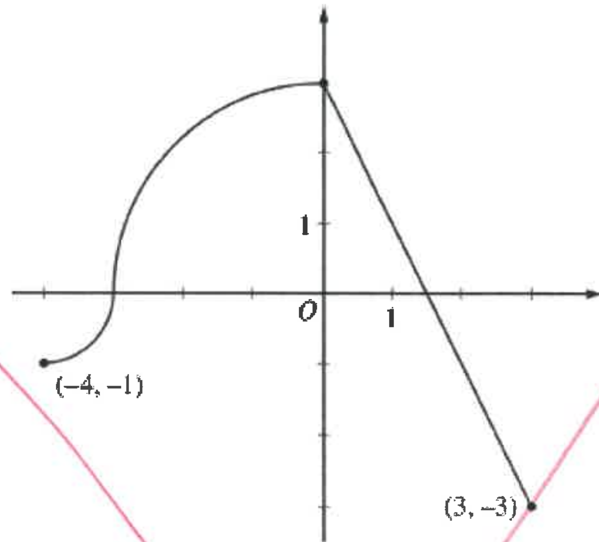
Name____Date____________________Class__________

Day #57 Homework

Find the derivative of each of the following functions defined by integrals.

1. $g(x)=\int_{2}^{3x}(2t+3)dt$	2. $h(x)=\int_{-2}^{x^4}3\sqrt{t}\,dt$
3. $f(x)=\int_{2x}^{-1}\left(t^2+2t\right)dt$	4. $H(x)=\int_{-5}^{\cos x}2t^2\,dt$
5. $P(x)=\int_{2}^{x^2+2x}(3t-2)dt$	6. $f(x)=\int_{\ln x}^{2}\left(e^t+t\right)dt$

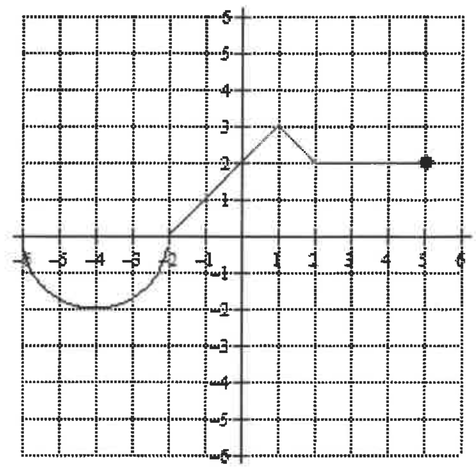


Graph of f

The continuous function f is defined on the interval $-4 \le x \le 3$. The graph consists of two quarter circles and one line segment, as show in the figure above. Let $g(x) = \frac{1}{2}x^2 + \int_0^x f(t)dt$.

Find the value of $g(3)$.	Find the value of $g(-4)$.
Find the value of $g'(3)$.	Find the value of $g''(2)$.

Pictured to the right is the graph of $f(t)$ and $F(x)=\int_{-6}^{2x} f(t)\,dt$. Use the graph and $F(x)$ to answer the questions 7 – 11.



7. Find the value of $F(0)$.

8. Find the value of $F\left(-\frac{1}{2}\right)$.

9. Find the value of $F'(-2)$.

10. Find the value of $F'(2.5)$.

11. Find the value of $F''(0)$

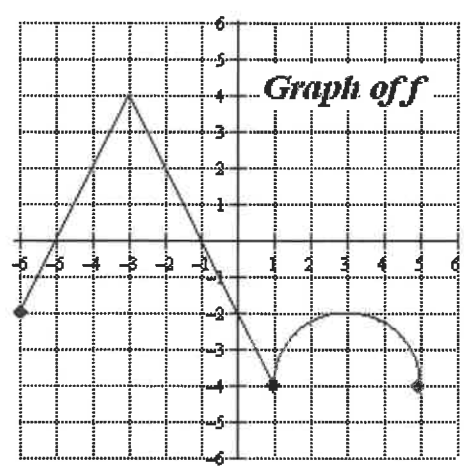
Pictured to the right is the graph of f and $G(x)=\int_{-2}^{x} f(t)\,dt$. Use the graph to answer questions 12 – 15.

12. Find the value of $G(3)$.

13. Find the value of $G(-4)$.

14. Find the value of $G'(-2)$.

15. Find the value of $G''(-5)$.



If $g(x)=\int_0^x t^3 e^t\,dt$, find each of the following values in questions 16 – 17.

16. Find the value of $g'(1)$.	17. Find the value of $g''(1)$.

If $h(x)=\int_{x^2}^{2}\sqrt{1+t^4}\,dt$, find each of the following values in questions 18 – 19.

18. Find $h'(x)$.	19. Find $h''(1)$.