

Unit #7—Advanced Integration and Applications
Homework Packet

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

1. $g(x) = \int_2^{3x} (2t+3)dt$

2. $h(x) = \int_{-2}^{x^4} 3\sqrt{t} dt$

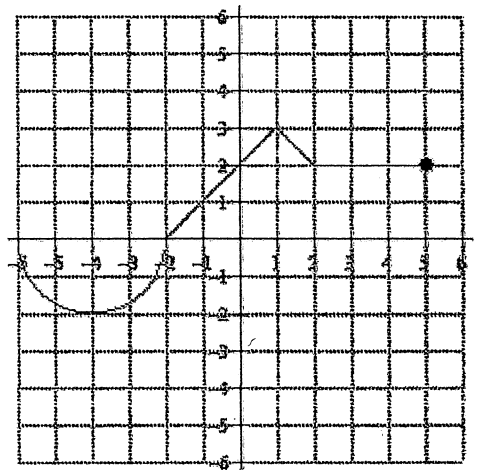
3. $f(x) = \int_{2x}^{-1} (t^2 + 2t)dt$

4. $H(x) = \int_{-5}^{\cos x} 2t^2 dt$

5. $P(x) = \int_2^{x^2+2x} (3t-2)dt$

6. $f(x) = \int_{\ln x}^2 (e^t + t)dt$

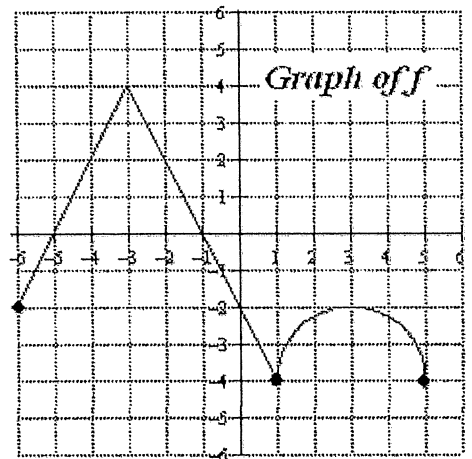
Pictured to the right is the graph of $f(t)$ and $F(x) = \int_{-6}^{2x} f(t) dt$. Use the graph and $F(x)$ to answer the questions 7 – 11.



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 $g''(1)$.
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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 $h''(1)$.
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