

**(5.3, 5.4) The Fundamental Theorem of Calculus (Definite Integrals) Notes**

<b>Fundamental Theorem of Calculus</b>	$\int_a^b f(x)dx = F(b) - F(a)$
<b>Fundamental Theorem of Calculus (Part II)</b>	$g(x) = \int_a^x f(t)dt$ then $g'(x) = f(x)$ or $\frac{d}{dx} \int_a^x f(t)dt = f(x)$

Solve. Round to the nearest hundredth if irrational.

1)  $\int_{-1}^1 (x^3 + x^2 - 2) dx$

2)  $\int_0^4 \left( \frac{1}{2}x^2 - 2e^x \right) dx$

3)  $\int_0^{\pi/2} (-3\sin x + \cos x) dx$

4)  $\int_1^4 (5 + \sqrt{x}) dx$

Find the derivative of the function.

5)  $\frac{d}{dx} \int_0^x (1 + \sqrt{t}) dt$

6)  $\frac{d}{dx} \left( \int_x^{\cos x} 1 dt \right)$

Find the total area.

7)  $\int_{-2}^3 |x^3| dx$

