$$\frac{d}{dx}\int_{\text{constant}}^{x} f(t)\,dt$$

$$\frac{d}{dx}\int_{\text{constant}}^{AT} f(t)\,dt$$

$$\frac{d}{dx}\int_{\text{constant}}^{x} f(t)\,dt = f(x)$$

$$\frac{d}{dx}\int_{\text{constant}}^{AT} f(t)\,dt = f(AT)\cdot\frac{d}{dx}[AT]$$

Evaluate Each:

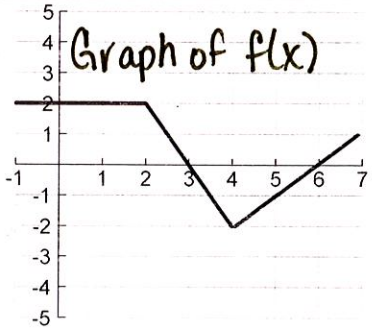
$$\frac{d}{dx}\int_{\pi}^{x} \sin t\,dt$$

$$\frac{d}{dx}\int_{x^3}^{5} \frac{\cos t}{t^2+2}\,dt$$

$$\frac{d}{dx}\int_{\pi}^{x} \sin t\,dt = \sin x$$

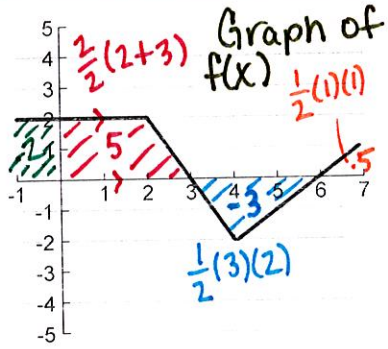
$$\frac{d}{dx}\int_{x^3}^{5} \frac{\cos t}{t^2+2}\,dt = -\frac{d}{dx}\int_{5}^{x^3} \frac{\cos t}{t^2+2}\,dt$$

$$= -\frac{\cos(x^3)}{(x^3)^2+2}\cdot[3x^2] = \frac{-3x^2\cos(x^3)}{x^6+2}$$



$A(x) = \int_0^x f(t)\,dt$ Find :

1. $A(-1)$
2. $A(3)$
3. $A(6)$
4. $A(7)$
5. $A'(1)$
6. $A'(5)$
7. $A''(3)$
8. $A''(4)$

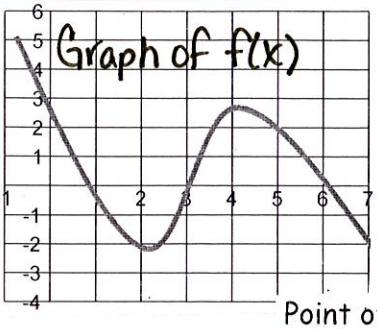


$\left[A(x) = \int_0^x f(t)\,dt\right]\frac{d}{dx}$ Find :

$A'(x) = f(x)$

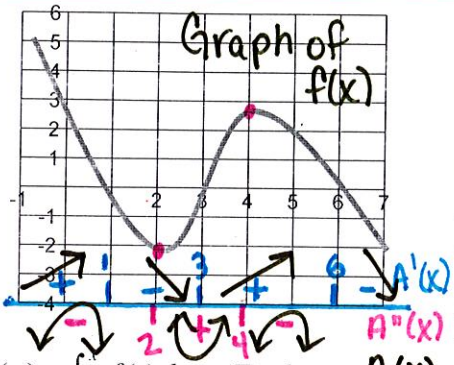
$A''(x) = f'(x)$ [slopes of f]

1. $A(-1) = \int_0^{-1} = -\int_{-1}^{0} = -2$
2. $A(3) = \int_0^3 = 5$
3. $A(6) = \int_0^6 = 5+-3 = 2$
4. $A(7) = \int_0^7 = 5+-3+.5 = 2.5$
5. $A'(1) = f(1) = 2$
6. $A'(5) = f(5) = -1$
7. $A''(3) = f'(3) = -2/1 = -2$
8. $A''(4) = f'(4) =$ sharp turn $=$ dne



A(x) is
Increasing:
Decreasing:
Maximum:
Minimum:
Concave Up:
Concave Down:
Point of Inflection:

$A(x) = \int_0^x f(t)dt$ *Find :*



$A(x) = \int_0^x f(t)dt$ *Find :*

A(x) is
Increasing: $(-\infty,1) \cup (3,6)$
Decreasing: $(1,3) \cup (6,\infty)$
Maximum: $x=1$ & $x=6$
Minimum: $x=3$
Concave Up: $(2,4)$
Concave Down: $(-\infty,2) \cup (4,\infty)$
Point of Inflection: $x=2$ & $x=4$

$A'(x) = f(x)$

$A''(x) = f'(x)$ = slopes of $f(x)$