

# AP Calculus AB

# The Accumulation Function

$$1) g(x) = \int_0^x f(t) dt$$

$$a) g(0) = 0$$

$$b) g(1) = \frac{1}{2}(1)(3)$$

$$c) g(2) = 0$$

$$d) g(-2) = 0$$

$$3) g(x) = 5 + \int_0^x f(t) dt$$

$$\begin{aligned} a) g(3) &= 5 + \int_0^3 f(t) dt \\ &= 5 + \frac{1}{4}\pi(2)^2 + \frac{1}{2}(1)(3) \\ &= \frac{13}{2} + \pi \end{aligned}$$

$$\begin{aligned} b) g(-2) &= 5 + \int_0^{-2} f(t) dt \\ &= 5 - \pi \end{aligned}$$

$$\begin{aligned} c) g(5) &= 5 + \int_0^5 f(t) dt \\ &= 5 + \pi + \frac{1}{2}\left(\frac{5}{2}\right)(3) - \frac{1}{2}\left(\frac{1}{2}\right)(1) \\ &= \frac{17}{2} + \pi \end{aligned}$$

$$5) \int_1^2 (x^2 + 3x - 2) dx = \left. \frac{1}{3}x^3 + \frac{3}{2}x^2 - 2x + C \right|_1^2$$

$$\left(\frac{8}{3} + 6 - 4\right) - \left(\frac{1}{3} + \frac{3}{2} - 2\right)$$

$$2) g(x) = 2x + \int_0^x f(t) dt$$

$$a) g(0) = 0$$

$$b) g(3) = 6 + \int_0^3 f(t) dt = 6$$

$$\begin{aligned} c) g(-3) &= -6 + \int_0^{-3} f(t) dt \\ &= -6 - \frac{1}{4}\pi(9) = -6 - \frac{9\pi}{4} \end{aligned}$$

$$\begin{aligned} d) g(-4) &= -8 + \int_0^{-4} f(t) dt \\ &= -8 - \frac{9\pi}{4} + \frac{1}{4}\pi = -8 - 2\pi \end{aligned}$$

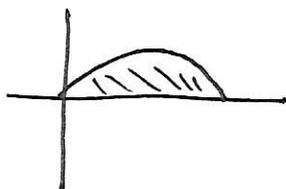
$$4) g(x) = \int_1^x f(t) dt$$

$$a) g(0) = \int_1^0 f(t) dt = 1$$

$$\begin{aligned} b) g(5) &= \int_1^5 f(t) dt \\ &= 3 \end{aligned}$$

$$c) g(-3) = -1$$

$$6) \int_0^{\pi} \sin x dx = -\cos x + C \Big|_0^{\pi}$$



$$\begin{aligned} &(-\cos \pi) - (-\cos 0) \\ &1 + 1 \\ &\boxed{2} \end{aligned}$$