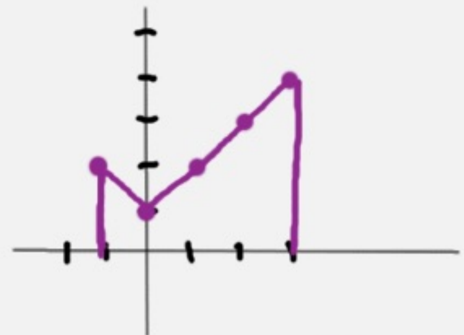
$\int \left(4x^{1/3} - 5x^{-1/3} + 1\right)dx$

$\frac{4x^{4/3}}{4/3} - \frac{5x^{2/3}}{2/3} + x + C$

$\boxed{3x^{4/3} - \frac{15}{2}x^{2/3} + x + C}$

$\int_{-1}^{3} \left(|x| + 1\right)dx$



$\frac{1}{2}\left[1(1+2) + 3(1+4)\right]$

$\frac{1}{2}(18) = \boxed{9}$

$\int_{\sqrt{2}}^{2} \left(\frac{x}{\left(x^2-1\right)^2}\right)dx$

$u = x^2 - 1$

$du = 2x\,dx$

$\frac{du}{2} = x\,dx$

$u = (2)^2 - 1 \to 3$

$u = (\sqrt{2})^2 - 1 \to 1$

$\int_{1}^{3} \frac{1}{u^2}\left(\frac{du}{2}\right)$

$\frac{1}{2}\left[-u^{-1}\right]\Big|_1^3 \to -\frac{1}{2}\left[\frac{1}{3} - 1\right] = \boxed{1/3}$

$$\int_4^9 \frac{2+x}{2\sqrt{x}}\,dx = \;\rightarrow\; \int_4^9 \left(x^{-1/2} + \frac{x^{1/2}}{2}\right)dx \rightarrow \left[2x^{1/2} + \tfrac{1}{3}x^{3/2}\right]\Big|_4^9$$

$$\rightarrow \left[2(9)^{1/2} + \tfrac{1}{3}(9)^{3/2}\right] - \left[2(4)^{1/2} + \tfrac{1}{3}(4)^{3/2}\right]$$

$$(6+9) - (4 + 8/3) = 15 - \frac{20}{3} = \boxed{\frac{25}{3}}$$

The table shows some values of continuous function f and its first derivative. Evaluate $\int_8^0 f'(x)\,dx$.

x	$f(x)$	$f'(x)$
0	11	3
2	15	2
4	16	−1
6	12	−3
8	7	0

$f(0) - f(8)$

$11 - 7 = \boxed{4}$

$$\int_{\pi/12}^{\pi/4} \frac{\cos 2x\,dx}{\sin^2 2x} =$$

$u = \sin(2x)$

$du = \cos(2x)2\,dx$

$\frac{du}{2} = \cos(2x)\,dx$

$u = \sin(2 \cdot \pi/4) = 1$

$u = \sin(2\pi/12) = 1/2$

$$\int_{1/2}^{1} \frac{1}{u^2}\left(\frac{1}{2}\right)du$$

$$-\tfrac{1}{2}\left[\frac{1}{u}\right]\Big|_{1/2}^{1}$$

$$-\tfrac{1}{2}\left[1-2\right]$$

$$\boxed{1/2}$$

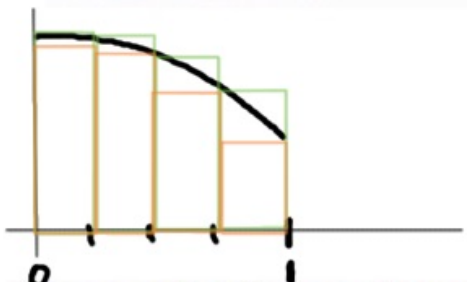
Let $A=\int_0^1 \cos x\,dx$. We estimate A using the L, R, and T approximations with $n = 100$ subintervals. Which is true?

(A) $L<A<T<R$

(B) $L<T<A<R$

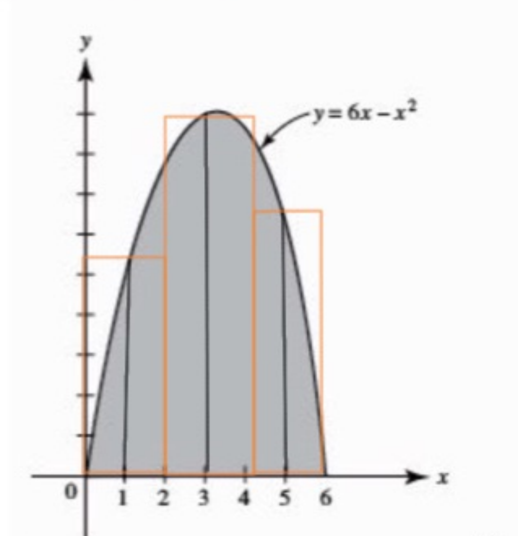
(C) $R<A<T<L$

(D) $R<T<A<L$



The graph of a continuous function f passes through the points (4,2), (6,6), (7,5), and (10,8). Using trapezoids, we estimate that $\int_4^{10} f(x)\,dx \approx$

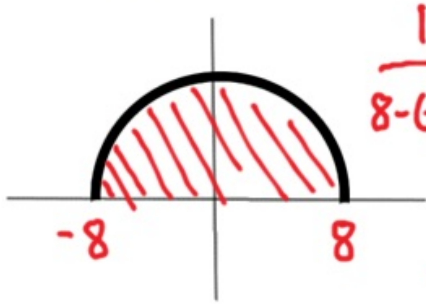
Using $M(3)$, we find that the approximate area of the shaded region below is



$2[f(1)+f(3)+f(5)]$

$2[5+9+5]=9.5$

The average value of $y=\sqrt{64-x^2}$ on its domain is



$$\frac{1}{8-(-8)}\int_{-8}^{8}\sqrt{64-x^2}\,dx$$

$$\frac{1}{16}\left[\tfrac{1}{2}\pi(8)^2\right]$$

$$\boxed{2\pi}$$

The average value of $\cos x$ over the interval $\frac{\pi}{3}\le x\le\frac{\pi}{2}$ is

$$\frac{1}{\frac{\pi}{2}-\frac{\pi}{3}}\int_{\pi/3}^{\pi/2}\cos(x)\,dx$$

$$\frac{6}{\pi}\left[\sin(x)\right]\Big|_{\pi/3}^{\pi/2}$$

$$\frac{6}{\pi}\left[\sin(\pi/2)-\sin(\pi/3)\right]$$

$$\frac{6}{\pi}\left[1-\frac{\sqrt{3}}{2}\right]=\frac{6}{\pi}\left[\frac{2-\sqrt{3}}{2}\right]$$

$$\boxed{\frac{3(2-\sqrt{3})}{\pi}}$$