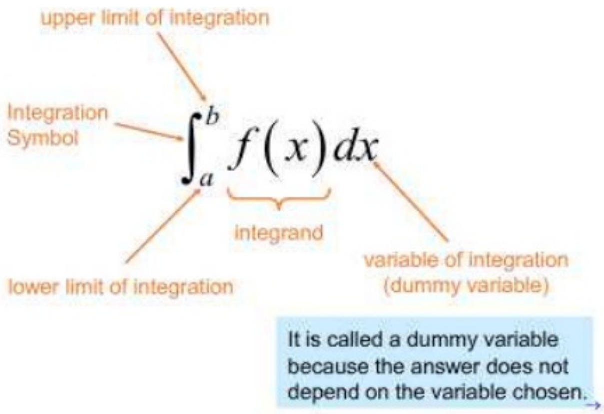
What you'll Learn About

- Terminology and Notation of Integration
- The Definite Integral
- Area under a curve using geometry
- Properties of Definite Integrals

Evaluate the definite integral using geometry



8) $\int_3^7 -20dx$

8A) $\int_2^7 22dx$

14) $\int_{.5}^{1.5} (-2x+4)dx$

16) $\int_{-4}^{0} \sqrt{16-x^2}\,dx$

	18) $\int_{-1}^{1}(1-\lvert x\rvert)dx$ 28) $\int_{a}^{\sqrt{3}a}(x)dx$ $Graph\ f(x)=\frac{1}{2}x^2$ using areas under the curve $\int_{0}^{1} xdx =$ $\int_{0}^{2} xdx =$ $\int_{0}^{3} xdx =$ $\int_{0}^{4} xdx =$ $\int_{0}^{5} xdx =$

	Use properties of Definite Integrals to answer the following $\int_1^9 f(x)dx = -1 \quad \int_7^9 f(x)dx = 5 \quad \int_7^9 h(x)dx = 4$ $a)\int_1^9 -2f(x)dx =$ $b)\int_7^9 [f(x)+h(x)]dx =$ $c)\int_7^9 [2f(x)-3h(x)]dx =$ $d)\int_9^1 f(x)dx =$ $e)\int_1^7 f(x)dx =$ $f)\int_9^7 [h(x)-f(x)]dx =$ $g)\int_9^9 h(x)dx =$

What you'll Learn About

- Average Value
- How to take the anti-derivative of a function
- How to evaluate the anti-derivative of a function (Part of the Fundamental Theorem of Calculus

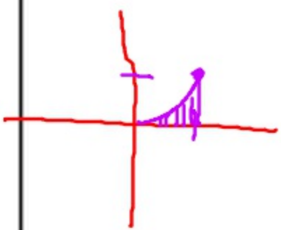
$-20(7) - (-20)(+3)$
$(-20)(7-3)$
$-20(4)$
-80

8) $\int_3^7 -20\,dx = -20x\Big]_3^7$

$-20(7) - (-20)(3)$
$-140 + 60$
-80

a) $\int_3^6 5\,dx = 5x\Big]_3^6$

$5(6) - 5(3)$
$30 - 15$
15

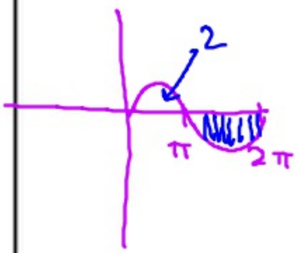


b) $\int_0^1 x^2\,dx = \frac{1}{3}x^3\Big]_0^1$

$\frac{1}{3}(1)^3 - \frac{1}{3}(0)^3$
$\frac{1}{3}$

d) $\int_0^1 x^3\,dx = \frac{1}{4}x^4\Big]_0^1$

$\frac{1}{4}(1)^4 - \frac{1}{4}(0)^4$
$\frac{1}{4}$

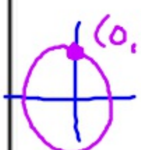


19) $\int_\pi^{2\pi} \sin x\,dx = -\cos x\Big]_\pi^{2\pi}$

$-\cos 2\pi - (-\cos\pi)$
$-1 + (-1)$
-2

22a) $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \csc^2 x\,dx = -\cot x\Big]_{\frac{\pi}{4}}^{\frac{\pi}{2}}$

$-\cot\left(\frac{\pi}{2}\right) - \left(-\cot\frac{\pi}{4}\right)$
$0 + 1 = 1$



$\tan = \frac{y}{x} = \frac{1}{0}$ ← $\sin x$

24a) $\int_{-1}^{4} -5x^3\,dx = -\frac{5}{4}x^4\Big]_{-1}^{4}$

$-5\int_{-1}^{4} x^3\,dx = -5\left(\frac{1}{4}x^4\right)$

$-\frac{5}{4}(4)^4 - \left(-\frac{5}{4}(-1)^4\right)$
$-5(4)^3$
$-320 + \frac{5}{4}$

28) $\int_0^{\frac{1}{2}} \frac{1}{\sqrt{1-x^2}}\,dx = \arcsin x\Big]_0^{1/2}$

$\arcsin\left(\frac{1}{2}\right) - \arcsin(0)$
$\frac{\pi}{6} - 0 = \frac{\pi}{6}$

	$30a)\int_1^2 \frac{1}{x^3}dx = \int_1^2 x^{-3}dx$ $= -\frac{1}{2}x^{-2}\Big]_1^2$ $= \frac{-1}{2x^2}\Big]_1^2$ $\frac{-1}{2(2)^2} - \left(\frac{-1}{2(1)^2}\right) = -\frac{1}{8} + \frac{1}{2}$ $34)\int_0^\pi (1+\cos x)dx =$	$30)\int_0^5 x^{3/2}dx = \frac{2}{5}x^{5/2}\Big]_0^5$ $\frac{2}{5}(5)^{5/2} - \frac{2}{5}(0)^{5/2}$ $\boxed{\frac{2}{5}\sqrt{5^5}}$ $40)\int_0^4 \frac{1-\sqrt{x}}{\sqrt{x}}dx =$