

Wednesday, February 6, 2019

12:24 PM

(10)

$$\int_1^4 x + \frac{1}{x} dx = \left. \frac{1}{2}x^2 + \ln x \right|_1^4$$

$$\frac{1}{2}(4)^2 + \ln 4 - \left( \frac{1}{2} \cdot 1^2 + \ln 1 \right)$$

$$8 + \ln 4 - \frac{1}{2} = 7.5 + \ln 4$$

(45)

$$\int_0^{\pi} |\cos x| dx = 2$$

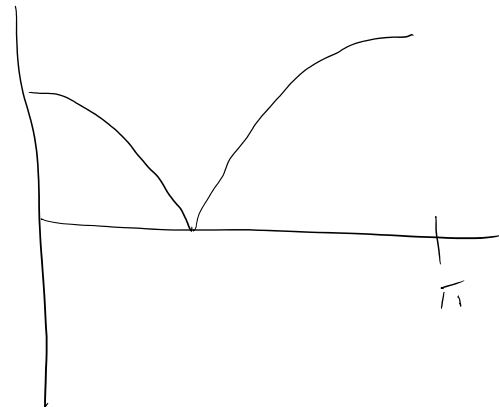
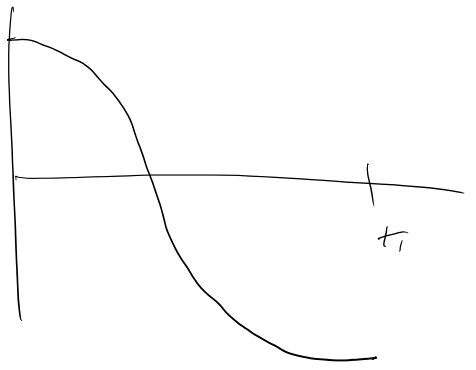
$$\int_0^{\pi/2} \cos x dx - \int_{\pi/2}^{\pi} \cos x dx$$

$$\sin x \Big|_0^{\pi/2} - \sin x \Big|_{\pi/2}^{\pi}$$

$$\sin \frac{\pi}{2} - \sin 0 - (\sin \pi - \sin \frac{\pi}{2})$$

$$1 - 0 - (0 - 1)$$

$$1 - -1 = 2$$



$$\textcircled{20} \int_1^2 x^2 - x^{-2} dx$$

$$\left. \frac{1}{3} x^3 + x^{-1} \right|_1^2$$

$$= \frac{1}{3} (2)^3 + 2^{-1} - \left( \frac{1}{3} \cdot 1^3 + 1^{-1} \right)$$

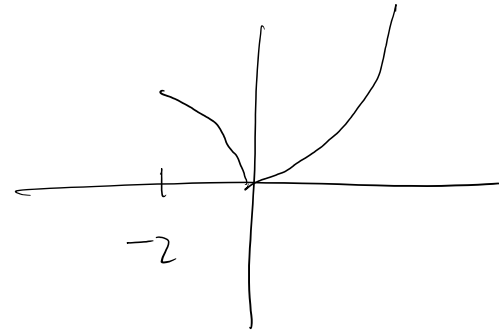
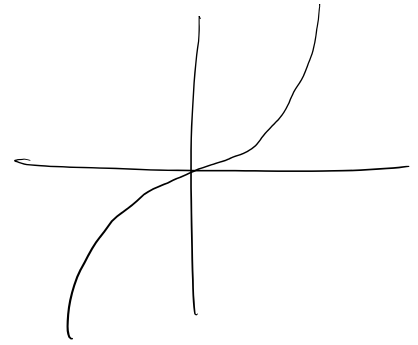
$$\frac{8}{3} + \frac{1}{2} - \left( \frac{1}{3} + 1 \right)$$

$$\frac{16}{6} + \frac{3}{6} - \frac{2}{6} - \frac{6}{6} = \frac{11}{6}$$

413

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

$$-\int_{-2}^0 x^3 dx + \int_0^3 x^3 dx$$



$$f(x) = 50 \cos\left(\frac{x}{100}\right)$$

$$f'(x) = -50 \sin\left(\frac{x}{100}\right) \cdot \frac{1}{100} = -\frac{1}{2} \sin\left(\frac{x}{100}\right)$$

$$y - 50 \cos\left(\frac{a}{100}\right) = -\frac{1}{2} \sin\left(\frac{a}{100}\right)(x - a)$$


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⑤ slope of secant line between  $x=0$  and  $x=a$

$$\frac{50 \cos\left(\frac{a}{100}\right) - 50}{a - 0} = -\frac{1}{2} \sin\left(\frac{a}{100}\right)$$

$$a = 45.934$$

⑥  $x = 100\pi$  at bottom of valley

$$f(x) = 50 \cos\left(\frac{100\pi}{100}\right) = 50 \cos \pi = -50$$

$$\begin{aligned} \text{slope of tangent line} &= -\frac{1}{2} \sin\left(\frac{45.934}{100}\right) \\ &= -0.221 \end{aligned}$$

$$\begin{aligned} y \text{ coordinate of point A} &= 50 \cos\left(\frac{45.934}{100}\right) \\ &= 44.817 \end{aligned}$$

$$y = -0.221(x - 45.934) + 44.817$$

$$\begin{aligned} y &= -0.221(100\pi - 45.934) + 44.817 \\ &= -14.460 \end{aligned}$$

$$\text{top of hump} = -50 + 25 = -25$$

No it's not visible.