

11) Suppose that  $f$  and  $g$  are continuous and that  $\int_3^7 f(x) dx = -2$  and  $\int_3^7 g(x) dx = 8$ .

11) 0

Find  $\int_3^7 [4f(x) + g(x)] dx$

$$4 \left( \int_3^7 f(x) \right) + \left( \int_3^7 g(x) \right)$$

Evaluate the definite integral.

12)  $\int_0^{\pi} 6 \sin x dx$

12) 12

$$4(-2) + (8) = -8 + 8$$

13)  $\int_{-2}^{-1} 2x^{-4} dx$

13) \_\_\_\_\_

12

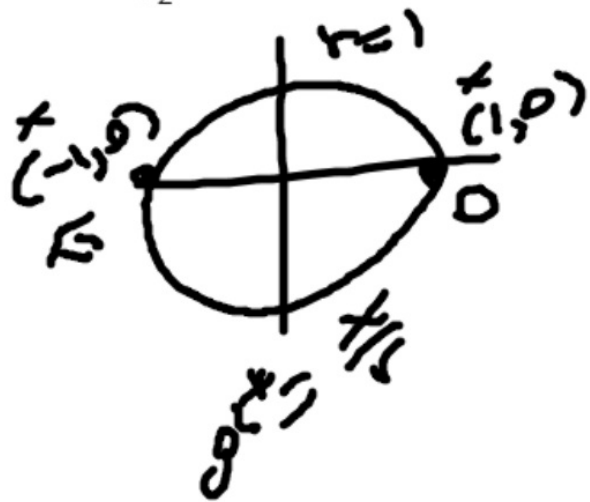
$$\int_0^{\pi} -6 \cos x$$

$$-6 \cos \pi - (-6 \cos 0)$$

$$F(b) - F(a)$$

$$-6(-1) - (-6(1))$$

$$6 + 6$$



13)  $\int_{-2}^{-1} 2x^{-4} dx$

Find the average value over the given interval.

14)  $y = 3 \sin x; [0, \pi]$

15)  $y = x^2 - 6x + 3; [0, 2]$

13

$$\int_{-2}^{-1} 2x^{-4} dx = 2 \left[ \frac{x^{-3}}{-3} \right]_{-2}^{-1} = -\frac{2}{3} \left[ (-1)^{-3} - (-2)^{-3} \right]$$

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

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

$$-\frac{2}{3} \left( -1 - \frac{1}{12} \right)$$

$$-\frac{2}{3} \left( -\frac{12}{12} - \frac{1}{12} \right)$$

$$-\frac{2}{3} \left( -\frac{13}{12} \right)$$

$$= \frac{26}{36} = \frac{13}{18}$$

13) 13/18

14) \_\_\_\_\_

15) \_\_\_\_\_

Find the average value over the given interval.

14)  $y = 3 \sin x; [0, \pi]$

$\int_0^\pi 3 \sin x$

14)  $\frac{6}{\pi}$

15)  $y = x^2 - 6x + 3; [0, 2]$

15) \_\_\_\_\_

(14)

$$\int_0^\pi -3 \cos x$$

$$-3 \cos \pi - (-3 \cos 0)$$

$$-3(-1) + 3(1) = 6$$

$$\frac{1}{\pi - 0} \cdot 6 = \frac{6}{\pi}$$

Find the average value over the given interval.

14)  $y = 3 \sin x; [0, \pi]$

15)  $y = x^2 - 6x + 3; [0, 2]$

$\frac{0 - 18}{3} = -6$

14)  $\frac{0 - 18}{3} = -6$   
15)  $\frac{-5}{3}$



$\int_0^2 (x^2 - 6x + 3) dx$

$\frac{1}{3}(2)^3 - 3(2)^2 + 3(2)$

$\frac{8}{3} - 12 + 6 = \frac{8}{3} - \frac{18}{3} = -\frac{10}{3}$

$\frac{-10}{3} \cdot \frac{1}{2} = -\frac{5}{3}$