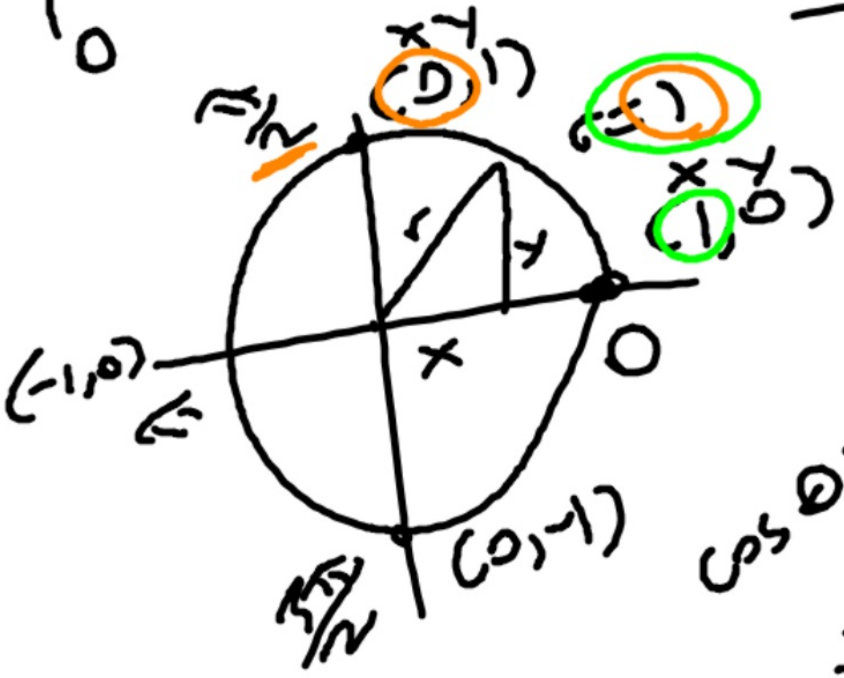
11) $\int_0^{\pi/2} 9 \sin x \, dx$

11) ______________

$$\Big[-9\cos x\Big]_0^{\pi/2} = -9\cos\frac{\pi}{2} - \underbrace{(-9\cos 0)}$$



$\cos\frac{\pi}{2} = \frac{0}{1} = 0$

$\cos 0 = \frac{1}{1} = 1$

$\cos\theta = \frac{x}{r}$

$= -9(0) - (-9(1))$

$= 9$

0

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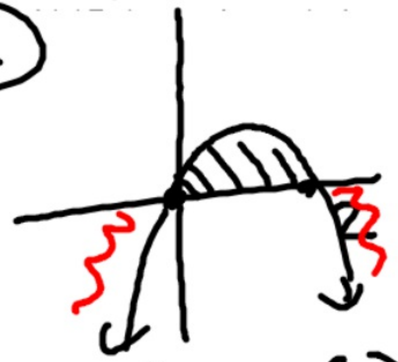
Find the total area of the region between the curve and the x-axis.

12) $y = 2x - x^2;\ 0 \le x \le 2$

13) $y = 2x + 7;\ 1 \le x \le 5$

$y = x(2-x)$

12



$$\int_0^2 (2x - x^2)\,dx$$

$$x^2 - \frac{1}{3}x^3 \Big|_0^2 = \left((2)^2 - \frac{1}{3}(2)^3\right) - 0 = 4 - \frac{8}{3}$$

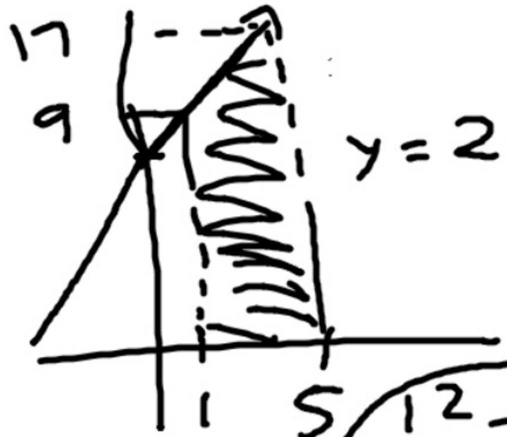
$$= \frac{4}{3}$$

13

$$A = \frac{1}{2}(9+17)(4)$$

$$= (13)(4)$$

$$= 52$$



$$\frac{12}{3} - \frac{8}{3}$$

Use the Trapezoidal Rule to estimate the integral.

14) $\int_0^2 4x^2\,dx$, n = 4 14) ____________

0 $\frac{1}{2}$ 1 $\frac{3}{2}$ 2

$\frac{h}{2}\left(y_0 + 2y_1 + 2y_2 + 2y_3 + y_4\right)$

15) $\int_{-\pi}^0 \sin x\,dx$, n = 4 15) ____________

$y_0 = 4(0)^2 = 0$

$y_1 = 4\left(\frac{1}{2}\right)^2 = 1$

$y_2 = 4(1)^2 = 4$

$y_3 = 4\left(\frac{3}{2}\right)^2 = 9$

$y_4 = 4(2)^2 = 16$

$A = \dfrac{\frac{1}{2}\left(0 + 2 + 8 + 18 + 16\right)}{2}$

$= \frac{1}{4}(44) = 11$

11

Use Simpson's Rule with n = 4 steps to estimate the integral.

16) $\int_0^2 4x^2\,dx$ 16) ______________

$$\frac{h}{3}\left(y_0 + 4y_1 + 2y_2 + 4y_3 + y_4\right)$$

$h = \frac{1}{2}$

$y_0 = 0$

$y_1 = 1$

$y_2 = 4$

$y_3 = 9$

$y_4 = 16$

$$A = \frac{\frac{1}{2}}{3}\left(0 + \overset{4}{4(1)} + \overset{8}{2(4)} + \overset{36}{4(9)} + 16\right)$$

$$= \frac{1}{6}(64) = \frac{32}{3}$$