

All questions are worth 7 points unless otherwise noted.
SHOW ALL WORK

Evaluate the integrals for 1) through 7).

1) $\int \sin(8x - 2) \, dx$

2) $\int_1^4 \frac{t^2 + 1}{\sqrt{t}} \, dt$

3) $\int x^6(x^7 - 8)^4 \, dx$

4) $\int_{-\pi/4}^{3\pi/4} 3 \sec \theta \tan \theta \, d\theta$

5) $\int_0^{\ln 3} e^{3x} \, dx$

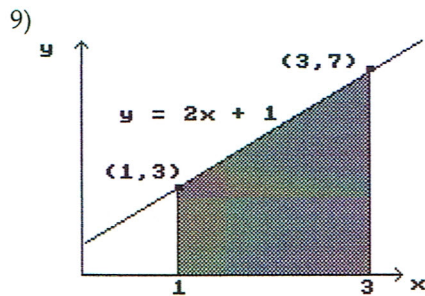
6) $\int_0^{\sqrt[3]{10}} x^2 \, dx$

7) $\int \frac{\ln x^3}{x} dx$

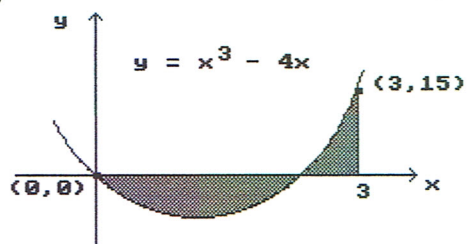
(9 POINTS) Use a finite sum to estimate the average value of the function on the given interval by partitioning the interval and evaluating the function at the midpoints of the subintervals.

8) $f(x) = x^2 - 3$ on $[-3, 7]$ divided into 5 subintervals

Find the area of the shaded region for 9) and 10).



10)



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

11) $y = \frac{3}{x^3}; \quad 1 \leq x \leq 3$

Find the average value of the function over the given interval.

12) $f(x) = 4 - x$ on $[0, 4]$

Evaluate the integral using the given substitution.

13) $\int 6(2x - 4)^{-6} dx$, $u = 2x - 4$

Use the substitution formula to evaluate the integral.

14) $\int_{\pi/3}^{2\pi} 3 \cos^2 x \sin x dx$