1) $\int \left(3x^9 + 2x - 13x^{6/7}\right) dx =$

2) $\int \left(\sin 2x + \cos 3x\right) dx =$

3) $\int 28x^3 (7x^4 - 10)^5 \, dx =$

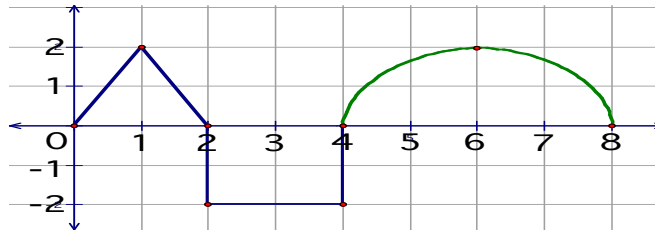4) $\int x^2 (x^3 + 6)^9 \, dx =$

5) $\int_0^1 \dfrac{32x^3}{\left(4x^4 + 1\right)^3} \, dx =$

6) $\int \cos^7 t \cdot \sin t \ dt =$

7) $\int x^2 \sqrt{x - 7} \, dx =$

8) Find $\dfrac{d}{dx} \displaystyle\int_{x^2}^{5} \sqrt{t^3 + 2} \ dt =$

9) Find $\displaystyle\int_0^6 f(x) \, dx$   $f(x) = \begin{cases} -x + 5 & \text{for} \quad x \le 5 \\ x^2 - 25 & \text{for} \quad x > 5 \end{cases}$

10) Find avg. value of $f(x) = 8x^3$ from $[1, 4]$.

11)  a)  $\displaystyle\int_0^8 f(x)\,dx =$ 

b)  $\displaystyle\int_0^8 |f(x)|\,dx =$ 

c)  $\displaystyle\int_0^8 \left(f(x)+5\right)dx =$

d)  $\displaystyle\int_2^6 f(x)\,dx =$ 

e)  $\displaystyle 3\int_8^4 f(x)\,dx =$ 

f)  $\displaystyle\int_0^4 f(x)\,dx =$

g)  $\displaystyle\int_6^4 f(x)\,dx =$ 

h)  $\displaystyle\int_5^5 10f(x)\,dx =$ 

i)  Avg. value from $[4,8] =$

12)  To estimate the surface area of a pool, a surveyor takes several measurements. The measurements are taken every 4 feet for the 32 ft. long pool, where $y$ represents the distance across the pool at each 4 ft. increment.

| $x$ | 0 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 |
|-----|---|---|---|----|----|----|----|----|----|
| $y$ | 0 | 9 | 11 | 13 | 14 | 11 | 10 | 8 | 6 |

a)  Estimate using Trapezoidal Rule

b)  Estimate Avg. value usingTrapezoidal Rule

c)  Estimate using Left Endpoint

d)  Estimate using 4 Midpoint subdivisions

13)  To estimate the area of a plot of land, I took measurements as shown below right.  The measurements are taken where $y$ represents the distance across the land in feet at each increment. Approximate the area of the land.

a)  Estimate using Right Endpoint

| $x$ | 0 | 5 | 8 | 10 |
|-----|----|---|---|----|
| $y$ | 12 | 7 | 8 | 11 |