

## Quiz # 10 — 12/01/16

Answer all questions in a clear and concise manner. Remember that answers without explanation or that are poorly presented may not receive full credit.

1. Find the area of the shaded region enclosed by the lines  $y = -x + 6$ ,  $y = x + 2$ , and  $y = 1$ .

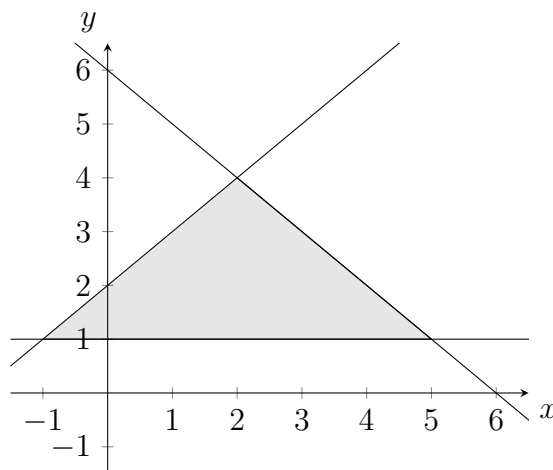
(a)  $\int_{-1}^2 x + 2 \, dx + \int_2^5 -x + 6 \, dx$

(b)  $\int_{-1}^2 x + 1 \, dx + \int_2^5 -x + 5 \, dx$

(c)  $\int_{-1}^5 2x - 4 \, dx$

(d)  $2 \int_1^4 x + 1 \, dx$

(e)  $\int_{-1}^2 -x + 6 \, dx + \int_2^5 x + 2 \, dx$



2. Evaluate the following integral using the Substitution Rule

$$\int_0^{\ln(2)} \frac{4e^x}{(2e^x + 3)^3} dx$$

Let  $u = 2e^x + 3$ . Then  $du = 2e^x dx$  so that  $4e^x dx = 2du$ . When  $x = 0$ ,  $u = 2e^0 + 3 = 5$  and when  $x = \ln(2)$ ,  $u = 2e^{\ln(2)} + 3 = 7$ . Thus

$$\int_0^{\ln(2)} \frac{4e^x}{(2e^x + 3)^3} dx = \int_5^7 \frac{2}{u^3} du = -\frac{1}{u^2} \Big|_5^7 = -\frac{1}{49} + \frac{1}{25}$$