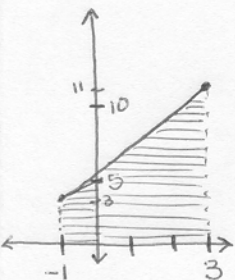


Key

## MATH 113 - QUIZ 13 - 30 APRIL 2007

Answer all of the following questions in the space provided. Show all work as partial credit may be given. Answers without justification, even if they are correct, will earn no credit.



1. (3 pts.) Find the area under the graph of the function  $f(x) = 2x + 5$  for  $x$  between  $-1$  and  $3$ . You may use any method you like.

$$\begin{aligned} \int_{-1}^3 (2x+5) dx &= \left( \frac{2x^2}{2} + 5x \right) \Big|_{-1}^3 = (x^2 + 5x) \Big|_{-1}^3 \\ &= (3^2 + 5(3)) - ((-1)^2 + 5(-1)) = (9+15) - (1-5) \\ &= 24 - (-4) = \boxed{28} \end{aligned}$$

2. (3 pts. each) Compute the following definite integrals.

(a)  $\int_0^2 (x^3 + 4x - 7) dx$

$$\begin{aligned} &= \left( \frac{x^4}{4} + \frac{4x^2}{2} - 7x \right) \Big|_0^2 = \left( \frac{2^4}{4} + \frac{4(2)^2}{2} - 7(2) \right) - \left( \frac{0^4}{4} + \frac{4(0)^2}{2} - 7(0) \right) \\ &= \left( \frac{16}{4} + \frac{16}{2} - 14 \right) - (0) = 4 + 8 - 14 = \boxed{-2} \end{aligned}$$

(b)  $\int_{-\pi/4}^{\pi/4} \sec^2(t) dt$

$$\begin{aligned} &= \tan(t) \Big|_{-\pi/4}^{\pi/4} = \tan(\pi/4) - \tan(-\pi/4) \\ &= 1 - (-1) = \boxed{2} \end{aligned}$$

(c)  $\int_1^2 \left( \frac{1}{x} + e^{-x} \right) dx$

$$\begin{aligned} &= \ln x - e^{-x} \Big|_1^2 = (\ln 2 - e^{-2}) - (\ln(1) - e^{-1}) \\ &= \ln(2) - \frac{1}{e^2} - \ln(1) + \frac{1}{e} \\ &= \ln(2) - \frac{1}{e^2} + \frac{1}{e} = \boxed{.92569} \end{aligned}$$