

MTHU131 Quiz 9 Review

1. Since 1990, the sales of *MNO* corporation have been changing at the rates (millions of dollars per year) given in the following table.

Years since 1990	0	2	4	6	8	10
Sales rate (mils. of \$ per year)	10	33	65	78	81	73

(a) Let $W(x)$ be the rate of change of sales of *MNO* corporation in millions of dollars per year, x years after 1990. Use the table above to find a quadratic model for the rate of change of sales. Give your model with four decimal places.

$$W(x) \approx Q(x) = -1.2098x^2 + 18.8411x + 6.8214$$

(b) Using the model in part (a), write down a definite integral which gives the change in sales of *MNO* corporation between 1990 and 1995. Compute this definite integral. Show work and give your answer with units.

$$\int_0^5 W(x) dx \approx \int_0^5 Q(x) dx = \left(-0.4033x^3 + 9.4205x^2 + 6.8214x \right) \Big|_0^5$$

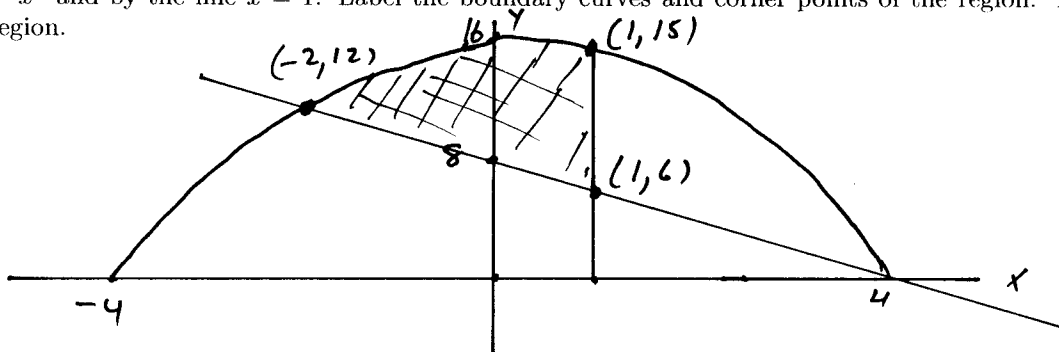
No Rounding: 219.2113 Rounding: 219.2124

2. The amount of money in a savings account t years after January 1, 2000 is given by the formula $A(t) = 10000e^{0.02t}$ dollars. Use a definite integral to find the average amount of money in the account between January 1, 2000 and January 1, 2004. Write down the definite integral you use clearly. Give your answer rounded to the nearest penny. Show your work especially how you evaluate the definite integral.

$$\text{Avg Amt} = \frac{1}{4} \int_0^4 A(t) dt = \frac{1}{4} \frac{(10000) e^{0.02t}}{0.02} \Big|_0^4 = 125,000 (e^{0.08} - e^0)$$

\$10,410.90

3a. Make a careful sketch of the region R that is bounded by the graphs of the functions $f(x) = 8 - 2x$ and $g(x) = 16 - x^2$ and by the line $x = 1$. Label the boundary curves and corner points of the region. Then shade the region.



3b. Set up a definite integral which gives the area of the region R . You don't have to compute the definite integral.

$$\int_{-2}^1 ((16 - x^2) - (8 - 2x)) dx$$