MATH 140
Spring 2003
Final Exam

ANSWERS:

1. E ; **2.** C ; **3.** A ; **4.** B ; **5.** E ; **6.** B ; **7.** A ; **8.** A ; **9.** B ; **10.** A ; **11.** D ; **12.** D ; **13.** A ; **14.** B.

15. a. F ; b. F ; c. F ; d. T ; e. T.

16. a. [The graph is the upper semicircle of radius r.]; b. $V = \int_{-r}^{r} \pi(r^2 - x^2)\, dx$; c. $V = \frac{4}{3}\pi r^3$.

17. a. $y = f(x_0) + f'(x_0)(x - x_0)$; b. $x = x_0 - \frac{f(x_0)}{f'(x_0)}$; c. $x_1 = x_0 - \frac{f(x_0)}{f'(x_0)}$.

18. a. The dimensions are 20 meters (the sides parallel to the highway) by 60 meters (the perpendicular sides); b. $ 480.

19. a. It is sliding down at 3 ft/sec (i.e. $y' = -3$); b. It is increasing at $\frac{1}{3}$ rad/sec; c. The area is increasing at $\frac{21}{2}$ ft$^2/sec$.