

Math 140 Final Exam Fall 2002 Answers

1.e, 2.d, 3.b, 4.b, 5.a, 6.a, 7.b, 8.c, 9.b, 10.c, 11.a, 12.a, 13.d, 14.a, 15.e,
16.d, 17.d, 18.d, 19.c.

20.(a) 112; (b) i. (Draw a picture of the approximating rectangles.)

$$21.(a) \int_0^2 \pi (16x^2 - x^6) dx \quad \text{OR} \quad \int_0^8 (2\pi y) \left(\sqrt[3]{y} - \frac{y}{4} \right) dy$$

$$(b) \int_0^2 (2\pi x)(4x - x^3) dx \quad \text{OR} \quad \int_0^8 \left(\pi y^{2/3} - \frac{\pi y^2}{16} \right) dy$$

$$22. 2 \tan \sqrt{x} + C$$

23.(a) This region is to the right of the line $y = x - 2$ and to the left of the sideways parabola $x = 4 - y^2$. The intersection points are $(0, -2)$ and $(3, 1)$. Ask in class for a full picture.

$$(b) \int_{-2}^1 [(4 - y^2) - (y + 2)] dy \quad \text{OR} \quad \int_0^3 [(x - 2) - (-\sqrt{4 - x})] dx + \int_3^4 [\sqrt{4 - x} - (-\sqrt{4 - x})] dx$$