Math 76   Hints and answers to practice problems for test 2

1. Use formulas given in section 8.7.   (a) 152   (b) 164   (c) 156

2. See section 8.8.

    (a) Use $\lim\limits_{t\to\infty}\left(\int_2^t e^{-x}dx\right)$. e^{-2}

    (b) Similar to (a), only $t\to -\infty$.   divergent

    (c) Use $=\lim\limits_{t\to 5^-}\int_3^t \dfrac{1}{x-5}dx$. $-\infty$

    (d) First split into 2 integrals.   10

3. Use formulas given in section 9.1.
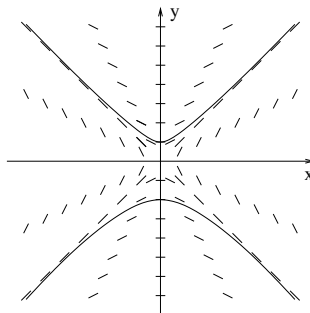
    (a) $2-\frac{1}{2}\ln 3 - \sqrt{2} - \frac{1}{2}\ln(\sqrt{2}-1) + \frac{1}{2}\ln(\sqrt{2}+1)$

    (b) $\frac{8}{27}\left(\left(\frac{85}{4}\right)^{3/2} - 10^{3/2}\right)$

4. See section 9.2.

    (a) $\dfrac{1}{27}\pi(145^{3/2}-1)$ (b) $\dfrac{1}{6}\pi(5^{3/2}-1)$

    (c) 2π (d) $\dfrac{1}{6}\pi\left(37^{3/2}-5^{3/2}\right)$

5. Find y' and y'' for $y=ce^{kx}$ and plug them into the equation.   Either $c=0$ (and k is any real number) or $k=3$ or -4 (and c is any real number).

6. See section 10.2

7. These are separable equations (see section 10.3).

    (a) $y=\pm\sqrt{x^2+K}$ (b) $y=e^{\sqrt{\frac{x^2}{2}+K}}$

8. See section 10.4.   6075

9. See section 11.1.

    (a) $y=1-\dfrac{x^2}{4}$ (the graph is a parabola)

    (b) $y=\dfrac{1}{x}$ (the graph is a hyperbola)

10. See section 11.2. $y=2x$

11. See section 11.3.   (a) $\left(-\dfrac{1}{2},\dfrac{\sqrt{3}}{2}\right)$ (b) $\left(2,\dfrac{11\pi}{6}\right)$