Answers to Winter 2011 Second Midterm Exam:

(1) $-\ln|x - 1| + 2\ln|x - 4| + C$
   (integration by partial fractions)

(2) (a) $\frac{2}{7}(x + 4)^{7/2} - \frac{16}{5}(x + 4)^{5/2} + \frac{32}{3}(x + 4)^{3/2} + C$
   (integration by u-sub with $u = x + 4$)
   
   (b) $\frac{x^4}{4}\ln x - \frac{1}{16}x^4 + C$
   (integration by parts with $u = \ln x$ and $dv = x^3$)

(3) omit this problem (topic not covered)

(4) the integral converges and equals 4

Answers to Fall 2012 Second Midterm Exam:

(1) $2x \sin(e^{x^2 + 1})$

(2) (a) $-\frac{x}{2}e^{-2x} - \frac{1}{4}e^{-2x} + C$
   (integration by parts with $u = x$ and $dv = e^{-2x}$)
   
   (b) $\frac{x}{4\sqrt{4 - x^2}} + C$
   (integration by trig sub with $x = 2\sin \theta$)

(3) $1 - \frac{1}{\ln(5)}$
   (integration by u-sub with $u = \ln x$)

(4) $-2\ln|x| + x^{-1} + 2\ln|x - 1| + C$
   (integration by partial fractions)

(5) $2\sqrt{3}$