Solution to Practice for Exam 1.

1.
$-\frac{1}{10}e^{-3t}\cos t + \frac{3}{10}\sin te^{3t} + C.$

2.
$t - \sqrt{7}arctan(\frac{t}{\sqrt{7}}) + C$

3.
$arcsin(\frac{x+4}{\sqrt{2}}) + (\frac{x+4}{\sqrt{2}})\sqrt{1-(\frac{x+4}{\sqrt{2}})^2} + C$

4.
$-\ln\left|\frac{1+\sqrt{1-(\frac{1}{1+(\frac{x+2}{\sqrt{3}})^2})}}{1-\sqrt{1-(\frac{1}{1+(\frac{x+2}{\sqrt{3}})^2})}}\right| + \sqrt{3}\sqrt{1+(\frac{x+2}{\sqrt{3}})^2} + C$

5.
$\frac{1}{2}arcsin(2(x-\frac{1}{2}))$+C

6.
$\frac{1}{2}\ln|\frac{1+\sin y}{1-\sin y}| + C$

7.
$2\ln|\frac{t-4}{t-2}| + C$

8.
$2\ln|u| - \ln|u^2+1| + C$

9.
$-5\ln|x-1| + 6\ln|x-2| + \frac{3}{x-1} + C$

10.
$\frac{2}{3}(x+1)^{\frac{3}{2}} - 2(x+1)^{\frac{1}{2}} + C$

11.
0

12.
$\frac{x^2}{2} + \frac{1}{2}\ln|\frac{x}{x+2}| + C$

13.
$\frac{\sin^3 y}{3} - \frac{\sin^5 y}{5} + C$

14.
$\frac{\sqrt{3}}{\sqrt{2}} arcsin(\frac{\sqrt{2}x}{\sqrt{3}}) + C$

15.
(a) $TRAP(2) = \frac{\sqrt{2}\pi}{8} + \frac{\pi}{8}$

(b) $MID(2) = \sin(\frac{\pi}{8})\frac{\pi}{4} + \sin(\frac{3\pi}{8})\frac{\pi}{4}$

(c) $SIMP(2) = \frac{\sin(\frac{\pi}{8})\frac{\pi}{2} + \sin(\frac{3\pi}{8})\frac{\pi}{2} + \frac{\sqrt{2}\pi}{8} + \frac{\pi}{8}}{3}$