Math 152 Week In Review: Sections 5.5-6.1

Solutions and questions can be found at the link:
https://www.math.tamu.edu/~kahlig/152WIR.html

1. Integrate the following: Note k is some non-zero constant.

   (a) $\int e^{kx}\ dx$

   (b) $\int \cos(kx)\ dx$

   (c) $\int \sin(kx)\ dx$

2. Integrate the following.

   (a) $\int 5x^2(x^3+7)^8\ dx$

(b) $\displaystyle\int \frac{x^2+2}{x^3+6x}\,dx$

(c) $\displaystyle\int (6x^2+8)e^{x^3+4x}\,dx$

(d) $\int 7e^{3x}\sin(e^{3x})\,dx$

(e) $\int \frac{\sec^2(x^{-3})}{x^4}\,dx$

(f) $\displaystyle\int \frac{5+4x}{x^2+1}\,dx$

(g) $\displaystyle\int x\sqrt{x+5}\,dx$

(h) $\displaystyle\int_0^{\pi/4} \frac{1}{\cos^2(x)\sqrt{1+\tan(x)}}\, dx$

(i) $\displaystyle\int_1^2 x^3(1-x^2)^5\, dx$

3. Sketch the region enclosed by these curves, and then find the area of the region.

   $y = 2x^2 + 5$

   $y = 5x^2 - 7$

4. Sketch the region enclosed by these curves. set up the integral with respect to both x and y that would give the area of the region.

   $y = \sqrt{2x + 6}$

   $y = x + 3$

5. Setup the integral(s) that would find the area bounded by these curves.

   $x = 2y^2 + 4y + 2$

   $x = y^2 + y + 12$

6. Find the area that is bounded(enclosed) by these curves from $x = -1$ to $x = 5$.

   $y = e^{3x}$

   $y = e^{-2x}$

7. Find the area of the region in the first quadrant that is bounded by these functions.

   $xy = 12$

   $3y = x$

   $3y = 4x$

8. Sketch the region that is bounded by the curve $y = e^{x/2}$, the tangent line to this curve at $x = 3$, the $x-$axis, and the $y-$axis. set up the integral(s) that will find the area of this region.