Math 201-203-RE

Practice Assignment 2

In this second practice assignment, you will review topics from sections 5.4, 5.5 and 8.5 (partial).
Try all problems for practice.
If you have difficulties, ask for help in class or in the instructor's office; all answers are shown in another file.

(1) Given $\displaystyle\int_{-3}^{0}\left[9k\sqrt{x+4}-6k^3\right]dx=0$, find the value(s) of k

(2) Given $\displaystyle\int_{0}^{4}\frac{6k}{4+3x}\,dx=4$, find the value(s) of k

(3) Given $\displaystyle\int_{1}^{2}\left[k^2-k\,(x-1)^3\right]dx=0$, find the value(s) of k

(4) Evaluate $\displaystyle\int_{-\pi/8}^{\pi}\sec^2(2x-3\pi)\,dx$

(5) Evaluate $\displaystyle\int_{0}^{\pi/2}\frac{3\sin x}{9\cos x+1}\,dx$

(6) Evaluate $\displaystyle\int_{0}^{1}\frac{9\left(2+e^{-3x}\right)^2}{e^{3x}}\,dx$

(7) Evaluate $\displaystyle\int_{0}^{\pi/4}\sec^2 x\,e^{1+2\tan x}\,dx$

(8) Evaluate $\displaystyle\int_{0}^{1}(9x-3)\,e^{3x^2-2x}\,dx$

(9) Evaluate $\displaystyle\int_{-1}^{0}\frac{12\left(x+e^{3x}\right)}{\left(3x^2+2e^{3x}\right)^2}\,dx$

(10) Evaluate $\displaystyle\int_{0}^{\pi/2}\frac{14\sin x}{\sqrt{9+7\cos x}}\,dx$

(11) Evaluate $\displaystyle\int_{0}^{1}\frac{6e^{1+\sqrt{x}}}{\sqrt{x}}\,dx$

(12) Evaluate $\displaystyle\int_{0}^{1}9e^{3x}\sqrt{e^{3x}+3}\,dx$

(13) Evaluate $\displaystyle\int_{0}^{2}18x^2\sqrt{9-x^3}\,dx$

(14) Evaluate $\displaystyle\int_{0}^{1}56x^3\left(x^4-1\right)^6\,dx$

(15) Evaluate $\displaystyle\int_{0}^{1}10x\sqrt[3]{(1-x^2)^2}\,dx$

(16) Evaluate $\displaystyle\int_{0}^{1}\frac{24(1+x)}{(1-6x-3x^2)^{2/3}}\,dx$

(17) Evaluate $\displaystyle\int_{0}^{1}\frac{9x^3-3x^2-2x-5}{3x+1}\,dx$

(18)Evaluate $\displaystyle\int_{0}^{1}\frac{16x^3}{(1+x^4)^2}\,dx$

(19) Evaluate $\displaystyle\int_{0}^{2}\frac{6x^2}{9-x^3}\,dx$

(20) Evaluate $\displaystyle\int_{0}^{\pi/2}6\cos x\,e^{1-2\sin x}\,dx$

(21) Evaluate $\displaystyle\int_{0}^{1}\frac{6x^3-5x^2-4x-2}{2x+1}\,dx$

(22) Evaluate $\displaystyle\int_{3}^{4}\left(\frac{6}{(x-2)^3}+\frac{5}{(x-2)^2}-\frac{2}{x-2}\right)dx$

(23) Determine $\displaystyle\int\left(3^{-x}+12e^{4x}+\frac{5}{e^{3x}}-e^3\right)dx$

(24) Determine $\displaystyle\int\left(5^{-3x}+6\cos 3x+\frac{6}{3x+5}+\pi^4\right)dx$

(25) Evaluate $\displaystyle\int_{-1}^{0} \frac{24\left(2x+x^3\right)}{\left(1-4x^2-x^4\right)^2}\,dx$

(26) Evaluate $\displaystyle\int_{1}^{2} \frac{9\left(x^2+2\right)}{x^3+6x}\,dx$

(27) Evaluate $\displaystyle\int_{0}^{3} \frac{18\,e^{3x}}{e^{3x}+2}\,dx$

(28) Evaluate $\displaystyle\int_{0}^{2} \frac{6x^2+13x-13}{x+3}\,dx$

(29) Evaluate $\displaystyle\int_{-1}^{0} \frac{9x^3+10x^2-16x+3}{x+2}\,dx$

(30) Evaluate $\displaystyle\int_{0}^{\ln(2)} \frac{6\left(e^{3x}+1\right)}{e^{3x}+3x}\,dx$

(31) Determine $\displaystyle\int \left(4^{-5x} - 8\,\sec^2 2x - \frac{9}{4+3x} + e^{\pi}\right)\,dx$

(32) Evaluate $\displaystyle\int_{2}^{3} \frac{2\left(x^3-1\right)}{\left(2x^4-8x\right)^2}\,dx$

(33) Evaluate $\displaystyle\int_{3}^{4} \frac{-8x^2+21x-12}{2-x}\,dx$

(34) Evaluate $\displaystyle\int_{1}^{2} \frac{4x^3\,e^{x^2-1}+6}{x^2}\,dx$

(35) Evaluate $\displaystyle\int_{0}^{\pi/3} \left(9\,\sin 3x - 4\,\sec x\,\tan x\right)\,dx$

(36) If $\displaystyle\int_{1}^{5} f(x)\,dx = 20$ and $\displaystyle\int_{1}^{0} f(x)\,dx = 17$; evaluate $\displaystyle\int_{0}^{5} \left[4\,f(x)+5\right]\,dx$

(37) If $\displaystyle\int_{3}^{5} 3\,f(x)\,dx = 5$ and $\displaystyle\int_{3}^{5} 2\,g(x)\,dx = 3$; evaluate $\displaystyle\int_{3}^{5} \left[6\,f(x)+4\,g(x)+7\right]\,dx$

(38) If $\displaystyle\int_{-4}^{1} 4\,f(x)\,dx = 2$ and $\displaystyle\int_{-4}^{1} 3\,g(x)\,dx = 9$; evaluate $\displaystyle\int_{-4}^{1} \left[2\,f(x)-6\,g(x)+12\right]\,dx$

(39) If $\displaystyle\int_{2}^{3} f(x)\,dx = 10$ and $\displaystyle\int_{2}^{-1} f(x)\,dx = 12$; evaluate $\displaystyle\int_{-1}^{3} \left[4\,f(x)+9\right]\,dx$

(40) If $\displaystyle\int_{-3}^{0} f(x)\,dx = 8$ and $\displaystyle\int_{1}^{0} f(x)\,dx = 5$; evaluate $\displaystyle\int_{-3}^{1} \left[4\,f(x)+7\right]\,dx$

(41) Sketch the region and find the area of the region bounded by $y=x^2-18$, $y=x-6$

(42) Sketch the region and find the area of the region bounded by $y=2x$, $y=x^2-3$, $x=-2$, $x=1$

(43) Sketch the region and find the area of the region bounded by $y=x^2-30$, $y=10-3x$

(44) Sketch the region and find the area of the region bounded by $x+y=2y^2$, $x+y=2$

(45) Sketch the region and find the area of the region bounded by $x=y^2$, $x=3-2y^2$

(46) Sketch the region and find the area of the region bounded by $y=x$, $y=x^5$

(47) The demand function for a product is $p=\sqrt{1225-0.15x}$.
If the equilibrium price is \$25 , sketch and find the consumers' surplus.

(48) The demand function for a product is $p=34-x^2$.
If the equilibrium price is \$9 , sketch and find the consumers' surplus.

(49) Sketch the region bounded by $f(x)=-x^2+4x+2$ and $g(x)=x+2$. Find the area of the region.

(50) Sketch the region bounded by $f(x) = x^3 - 2x + 1$, $g(x) = -2x$, $x = 1$. Find the area of the region.

(51) Sketch the region bounded by $f(x) = x^2 - 4x + 3$ and $g(x) = 3 + 4x - x^2$. Find the area of the region.

(52) The supply function for a product is $p = 0.06x^2 + 10x + 3$.
If the equilibrium quantity is 10 units , sketch and find the producers' surplus.

(53) The demand function for a product is $p = 1000\,e^{-0.01x}$.
If the equilibrium quantity is 25 units , sketch and find the consumers' surplus.

(54) The supply function for a product is $p = 0.08x^3 + 100$.
If the equilibrium quantity is 20 units , sketch and find the producers' surplus.

(55) The demand function for a product is $p = \dfrac{100}{10 + 0.05x}$.

If the equilibrium quantity is 200 units , sketch and find the consumers' surplus.

(56) The supply function for a product is $p = 100\sqrt{4 + 3x}$.
If the equilibrium quantity is 4 units , sketch and find the producers' surplus.

(57) Sketch the region bounded by $f(y) = x = y(2 - y)$ and $g(y) = x = -y$. Find the area of the region.

(58) Sketch the region bounded by $f(y) = x = y^2 + 1$, $g(y) = x = 0$, $y = -1$, $y = 2$.
Find the area of the region.

(59) Sketch the region bounded by $f(y) = x = y^2$ and $g(y) = x = y + 2$. Find the area of the region.

(60) Suppose that the supply function for a product is $p = 4x^2 + 2x + 2$.
If the equilibrium price is \$422 , sketch and find the producers' surplus.

(61) The demand function for a product is $p = \dfrac{200}{x + 2}$.

If the equilibrium quantity is 8 units , what is the consumers' surplus.

(62) If the supply function for a commodity is $p = 10\,e^{x/3}$,
sketch and find the producers' surplus when 15 units are sold.

(63) The demand function for a certain product is $p = 81 - x^2$ and the supply function
is $p = x^2 + 4x + 11$. Sketch and find the equilibrium point and the consumers' surplus.

(64) Sketch the region bounded by $f(x) = x^2 - 4x + 3$ and $g(x) = -x^2 + 2x + 3$. Find the area of the region.

(65) Sketch the region bounded by $f(x) = (x - 1)^3$ and $g(x) = x - 1$. Find the area of the region.

(66) Sketch the region bounded by $f(y) = x = y^2 - 4y$ and $g(y) = x = y - 6$. Find the area of the region.

(67) Sketch the region bounded by $f(y) = x = \sqrt[3]{y}$ and $g(y) = x = y^2$. Find the area of the region.

(68) Sketch the region bounded by $f(y) = x = y^2 - 2y$ and $g(y) = x = y - 2$. Find the area of the region.

(69) Sketch the region bounded by $f(y) = x = y^2 - y$ and $g(y) = x = y + 8$. Find the area of the region.

(70) If the supply function for a commodity is $p = 0.01x^3 + 50$,
sketch and find the producers' surplus when 5 units are sold.

(71) Sketch the region bounded by $f(x) = 2x^2 + 2x$ and $g(x) = x^2 - x + 4$ from $x = -2$ to $x = 2$.
Find the area of the region.

(72) Sketch the region bounded by $f(x) = x^3 - x^2 + 6$ and $g(x) = x^2 + 3x + 6$ from $x = -1$ to $x = 2$. Find the area of the region.

(73) Sketch the region bounded by $f(y) = x = -y^2 + 2y - 2$ and $g(y) = x = -2y^2 + y$ from $y = -2$ to $y = 2$. Find the area of the region.

(74) Sketch the region bounded by $f(y) = x = 2y^3 + 4y$ and $g(y) = x = y^3 - y^2 + 4y$ from $y = -1$ to $y = 2$. Find the area of the region.

(75) Sketch the region bounded by $f(x) = x^4 - 16$ and $g(x) = 4x^2 - 16$ from $x = 0$ to $x = 3$. Find the area of the region.

(76) If $\displaystyle\int_{-1}^{2} 2\,f(x)\,dx = 10$ and $\displaystyle\int_{-1}^{2} g(x)\,dx = 7$; evaluate $\displaystyle\int_{-1}^{2} [f(x) - 2\,g(x) + 3]\,dx$

(77) If $\displaystyle\int_{1}^{3} 4\,f(x)\,dx = 8$ and $\displaystyle\int_{1}^{3} 2\,g(x)\,dx = 3$; evaluate $\displaystyle\int_{1}^{3} [3\,f(x) - 4\,g(x) + 5]\,dx$

(78) If $\displaystyle\int_{-1}^{0} f(x)\,dx = 11$ and $\displaystyle\int_{-3}^{-1} f(x)\,dx = 3$; evaluate $\displaystyle\int_{-3}^{0} [4\,f(x) - 1]\,dx$

(79) If $\displaystyle\int_{4}^{5} f(x)\,dx = 6$ and $\displaystyle\int_{0}^{5} f(x)\,dx = 1$; evaluate $\displaystyle\int_{0}^{4} [2\,f(x) + 3]\,dx$

(80) If $\displaystyle\int_{-3}^{2} f(x)\,dx = 3$ and $\displaystyle\int_{0}^{-3} f(x)\,dx = 7$; evaluate $\displaystyle\int_{0}^{2} [2\,f(x) + 5]\,dx$

(81) Evaluate $\displaystyle\int_{1}^{e} \frac{(3 + 2\ln x)^2}{4x}\,dx$

(82) Evaluate $\displaystyle\int_{1}^{e} \frac{6}{x\,(4 + 3\ln x)^2}\,dx$

(83) Evaluate $\displaystyle\int_{-1}^{0} \frac{\ln\sqrt{3x+4}}{3x+4}\,dx$

(84) Evaluate $\displaystyle\int_{0}^{1} \frac{6x^2}{e^{x^3-1}}\,dx$

(85) Evaluate $\displaystyle\int_{-\pi/6}^{0} \ln\left[\cos^3(2x)\right]\,\tan(2x)\,dx$

(86) Evaluate $\displaystyle\int_{1}^{e} \frac{e^{1+\ln x}}{x}\,dx$

(87) Evaluate $\displaystyle\int_{0}^{\ln 2} \frac{\ln(1+e^x)}{1+e^x}\,e^x\,dx$

(88) Evaluate $\displaystyle\int_{0}^{1} \left(\frac{4\ln(x+1)}{x+1} + 2\,e^{2x}\right)dx$

(89) Sketch the region bounded by $f(x) = -x^2 + 4x$ and $g(x) = x^2 - 6$ from $x = -1$ to $x = 2$. Find the area of the region.

(90) Sketch the region bounded by $f(x) = x^2$ and $g(x) = 2x + 3$ from $x = 0$ to $x = 4$. Find the area of the region.

(91) Sketch the region bounded by $f(x) = 2x^2 - 2x$ and $g(x) = 2x + 16$ from $x = -3$ to $x = 0$. Find the area of the region.

(92) Sketch the region bounded by $f(x) = 2x^2$ and $g(x) = 4x + 16$ from $x = -1$ to $x = 2$. Find the area of the region.

(93) Sketch the region bounded by $f(x) = x^2 - x$ and $g(x) = x + 8$ from $x = 0$ to $x = 5$. Find the area of the region.

(94) If the demand function for a commodity is $p = -x^2 + 250$ and the supply function is $p = x^2 + 50$, sketch both functions on same axis ; then shade and evaluate the consumers' surplus.

(95) If the demand function for a commodity is $p = -x^2 + 400$ and the supply function is $p = x^2 + 34x$, sketch both functions on same axis ; then shade and evaluate the producers' surplus.

(96) If the demand function for a commodity is $p = \frac{100}{\sqrt{x+25}}$ and the supply function is $p = \sqrt{x+25}$, sketch both functions on same axis ; then shade and evaluate the producers' surplus.

(97) If the demand function for a commodity is $p = \frac{250}{x+20}$ and the supply function is $p = x + 5$, sketch both functions on same axis ; then shade and evaluate the consumers' surplus.

(98) If the demand function for a commodity is $p = -x^2 + 24$ and the supply function is $p = x^2 + 2x$, sketch both functions on same axis ; then shade and evaluate the consumers' surplus and the producers' surplus.

(99) If the demand function for a commodity is $p = -x^2 + 100$ and the supply function is $p = 2x + 20$, sketch both functions on same axis ; then shade and evaluate the consumers' surplus and the producers' surplus.

(100) If the demand function for a commodity is $p = -x^2 + 100$ and the supply function is $p = 3x + 30$, sketch both functions on same axis ; then shade and evaluate the consumers' surplus and the producers' surplus.