CALC I Sec. 4.1 HW SOLUTIONS

#11. $\int \sqrt[3]{x}\,dx = \int x^{1/3}\,dx = \frac{x^{4/3}}{4/3} + C = \boxed{\frac{3}{4}x^{4/3} + C}$

You may leave in exp. form

#13. $\int \frac{1}{x\sqrt{x}}\,dx = \int \frac{1}{x^{3/2}}\,dx = \int x^{-3/2}\,dx = \frac{x^{1/2}}{1/2} + C = \boxed{2x^{1/2} + C}$

#15. $\int (x+7)\,dx = \boxed{\frac{x^2}{2} + 7x + C}$ (power rule)

#17. $\int (x^5+1)\,dx = \boxed{\frac{x^6}{6} + x + C}$

#19 $\int (x^{3/2} + 2x + 1)\,dx = \boxed{\frac{x^{5/2}}{5/2} + \frac{2x^2}{2} + x + C}$

NOTE: Unless there is a reason to do so, DO NOT simplify your result.

IF YOU SIMPLIFY YOUR RESULT ON THE EXAM WHEN YOU ARE DIRECTED NOT TO YOU WILL NOT RECEIVE FULL CREDIT, and QUITE POSSIBLY NO CREDIT AT ALL

#21. $\int \sqrt[3]{x^2}\,dx = \int x^{2/3}\,dx = \boxed{\frac{x^{5/3}}{5/3} + C}$

23 $\int \frac{1}{x^5}\,dx = \int x^{-5}\,dx = \boxed{\frac{x^{-4}}{-4} + C}$

CONT:

(25.) $\int \frac{x+6}{\sqrt{x}}\,dx = \int \frac{x+6}{x^{1/2}}\,dx$ ← SPLIT THE NUMERATOR

$= \int \left(\frac{x}{x^{1/2}} + \frac{6}{x^{1/2}}\right) dx$

$= \int \left(x^{1/2} + 6x^{-1/2}\right) dx = \boxed{\frac{x^{3/2}}{3/2} + \frac{6x^{1/2}}{1/2} + C}$

DO NOT SIMPLIFY!!!

ON THE EXAM WITH DERIVATIVES IT WAS OBVIOUS THAT MANY STUDENTS USED A CALCULATOR OR COMPUTER TO FIND DERIVATIVES. IT WAS OBVIOUS TO ME. I'VE BEEN DOING THIS LONGER THAN MANY OF YOU HAVE BEEN ALIVE. I CAN TELL. IT IS OBVIOUS.

IF YOU USE A CALCULATOR OR COMPUTER OR IF I SUSPECT YOU ARE DOING SO, YOU WILL RECEIVE NO CREDIT!!

WARNING = A CALCULATOR OR COMPUTER WILL SIMPLIFY THE RESULT, BUT I AM SPECIFICALLY DIRECTING YOU NOT TO SIMPLIFY. AGAIN, IT WILL BE OBVIOUS.

cont

#27. $\int (x+1)(3x-2)\,dx = \int (3x^2+x-2)\,dx$ (FOIL)

$= \boxed{\frac{3x^3}{3} + \frac{x^2}{2} - 2x + C}$

29. $\int (5\cos(x) + 4\sin(x))\,dx = \boxed{5\sin(x) - 4\cos(x) + C}$

31. $\int (\csc(x)\cot(x) - 2x)\,dx = \boxed{-\csc(x) - \frac{2x^2}{2} + C}$

33. $\int (\sec^2(\theta) - \sin(\theta))\,d\theta = \boxed{\tan(\theta) + \cos(\theta) + C}$

NOTE: WE MAY CHECK: $\frac{d}{d\theta}[\tan(\theta) + \cos(\theta) + C] = \sec(\theta) - \sin(\theta)$ ←

35. $\int (\tan^2(y) + 1)\,dy =$ NOTE: $\tan^2(y)$ is NOT a basic form so use an ident.ty: $\tan^2(y) + 1 = \sec^2(y)$

$= \int \sec^2(y)\,dy = \boxed{\tan(y) + C}$