MATH 2 PROBLEM SET #7 SOLUTIONS

(1.) $\int \frac{x}{\sqrt{x^2+1}}\,dx = \sqrt{x^2+1} + C.$

TO SEE THIS, $\frac{d}{dx}\sqrt{x^2+1} = \frac{d}{dx}(x^2+1)^{\frac{1}{2}}$

$= \frac{1}{2}(x^2+1)^{-\frac{1}{2}} \cdot 2x = \frac{x}{\sqrt{x^2+1}}.$

(CHAIN RULE)

(7.) $\int \left(x^4 - \frac{1}{2}x^3 + \frac{1}{4}x - 2\right)dx$

$= \boxed{\frac{1}{5}x^5 - \frac{1}{8}x^4 + \frac{1}{8}x^2 - 2x + C}.$ (YOU CAN ALSO CHECK BY DIFFERENTIATING.)

(POWER RULE FOR INTEGRALS)

$\boxed{(8.)}$ $\int (y^3 + 1.8y^2 - 2.4y)\,dy = \boxed{.25y^4 + .6y^3 - 1.2y^2 + C}.$

(POWER RULE FOR INTEGRALS)

(21.) $\int_0^2 (6x^2 - 4x + 5)\,dx = \left[2x^3 - 2x^2 + 5x\right]_0^2 = \boxed{18}.$

(23.) $\int_{-1}^0 (2x - e^x)\,dx = \left[x^2 - e^x\right]_{-1}^0 = (-1) - (1 - \frac{1}{e})$

$= \boxed{\frac{1}{e} - 2}.$

$\boxed{(32.)}$ $\int_0^5 (2e^x + 4\cos x)\,dx = \left[2e^x + 4\sin x\right]_0^5$

$= (2e^5 + 4\sin(5)) - (2e^0 + 4\sin(0))$

$= \boxed{2e^5 + 4\sin(5) - 2}.$