

# QSci 292 • answers • Hmwk #2

Neu 3<sup>rd</sup> ed, sec. 5.8, p272

Neu 2<sup>nd</sup> ed, sec. 5.8.1, p330



$$\#6) F = \int (2x^3 + x^2 - 5x) dx = 2 \int x^3 dx + \int x^2 dx - 5 \int x dx$$

$$F = \frac{1}{2}x^4 + \frac{1}{3}x^3 - \frac{5}{2}x^2 + C$$

$$\#6) 2^{\text{nd}} \text{ ed } F = \int (2x^2 + x - 5) dx$$

$$F = \frac{2}{3}x^3 + \frac{1}{2}x^2 - 5x + C$$

$$\#9) F = \int \left(1 + \frac{1}{x} + \frac{1}{x^2}\right) dx = \int dx + \int \frac{1}{x} dx + \int \frac{1}{x^2} dx$$

$$F = x + \ln(x) - \frac{1}{x} + C$$

note: implied "1"

$$\#9) 2^{\text{nd}} \text{ ed } F = \int \left(1 + \frac{1}{x}\right) dx$$

$$F = x + \ln(x) + C$$

$$\#13) F = \int \frac{1}{1+x} dx$$

$$F = \ln(1+x) + C$$

$$\text{S.M.: } z = 1+x \\ dz = dx$$

$$\#19) F = \int e^{-3x} dx$$

$$F = -\frac{1}{3}e^{-3x} + C$$

$$\text{S.M.: } z = -3x \\ dz = -3 dx \\ dx = -\frac{1}{3} dz$$

$$\#21) F = \int 2e^{2x} dx = 2 \int e^{2x} dx$$

$$F = e^{2x} + C$$

$$\text{S.M.: } z = 2x \\ dz = 2 dx \\ dx = \frac{1}{2} dz$$

# QSci 292 • answers • Hmwk #2

Neu 3<sup>rd</sup> ed, sec. 6.2, p 305

Neu 2<sup>nd</sup> ed, sec. 6.2.4, p 371

$$\#100) A = \int_1^2 x^{5/2} dx ; F = \frac{2}{7} x^{7/2} + C$$

$$A = F(2) - F(1) = \frac{2}{7} (2^3 \sqrt{2} - 1) \quad \boxed{A = 2.947}$$

$$\#102) A = \int_4^9 \left( \frac{1+\sqrt{x}}{\sqrt{x}} \right) dx = \int_4^9 \left( \frac{1}{\sqrt{x}} + 1 \right) dx ; F = 2\sqrt{x} + x + C$$

$$A = F(9) - F(4) = 2(\sqrt{9} - \sqrt{4}) + (9 - 4) \quad \boxed{A = 7}$$

$$\#109) A = \int_0^1 \left( \frac{1}{1+x^2} \right) dx ; F = \arctan(x) + C$$

$$A = \arctan(1) - \arctan(0) \quad \boxed{A = \pi/4 = 0.785}$$

$$\#116) A = \int_0^2 2t e^{t^2} dt ; F = e^{t^2} + C$$

$$A = F(2) - F(0) = e^{2^2} - e^0 \quad \boxed{A = e^4 - 1 = 53.6}$$

$$\#119) A = \int_1^e \frac{1}{x} dx ; F = \ln(x) + C$$

$$A = F(e) - F(1) \quad \boxed{A = \ln e - \ln 1 = 1}$$