

Answer for Tutorial Problems**Tutorial Sheet 8**

1. a) $M_0x(2L^2 - 3Lx + x^2)/6EI$; **b)** $(-w_0L^4/\pi^4EI) \sin(\pi x/L)$; **c)** $-P[3(L-a)x^2 - x^3]/6EI$ for AC and $-P(L-a)^2(3x-L+a)/6EI$ for CB; **d)** $w x^5/60EI + (w/30EI)(x-L/2)^5 + wLx^3/24EI - 5wL^3x/192EI$; **2.** $-5wL^4/24EI$; **3.** $-Pa^2(L+a)/3EI$; **4.** $-PL^3/48EI, PL^2/16EI, -PL^2/24EI$; **5.** $PL^2/96EI, -PL^3/64EI$; **6.** $7PL^3/24EI$.

Tutorial Sheet 9

1. $V_B = 5P/16$; **3.** $V_A = Pb^3/(a^3 + b^3), V_B = Pa^3/(a^3 + b^3), M_A = Pb^3a/(a^3 + b^3), M_B = -Pa^3b/(a^3 + b^3)$; **4.** $R_A = 3wL/32, V_B = 29wL/32, M_B = 13wL^2/32$; **5.** $V_A = -3M_1/2L, V_B = 3M_1/2L, M_A = -M_1/4, M_B = -M_1/4$; **6.** $V_A = 13wL/32, V_B = 3wL/32, M_A = 11wL^2/192, M_B = 5wL^2/192$; **7.** $R = 45.76 \text{ kN}, M_A = 102.71 \text{ kNm}, V_A = 5.76 \text{ kN}$; **8.** $V_A = 3wL/8, V_B = 5wL/4, V_C = 3wL/8$.

Tutorial Sheet 10

1. 1456.5 N; **2.** 64.4 mm; **3.** 0.2195; **4.** $a/b = 0.35$; **5.** $b = 303.35 \text{ mm}, 13280.5 \text{ kN}$; **6.** 0.293kL & 1.707kL; **7. & 8. theory not discussed in class.**

Tutorial Sheet 11

1. $(5\sqrt{5}+4)PL^2/8AE \text{ N}$; **2.** $U_B+U_S = w^2L^5[1 + (E/G)(d/L)^2]/240EI$; **3.** $14T^2L/3\pi Gd^4, 28TL/3\pi Gd^4$; **4.** $(PL/AE)\ln 2$; **5.** $PL^3/48EI$; **6.** $PL^3(4 + 3E/G)/6EI$; **7.** $5P/16$; **8.** $3wL/32$.