

COT 4500 Quiz #3 Solutions

$$1) \frac{5(x-7)(x-9)(x-13)}{(2-7)(2-9)(2-13)} + \frac{13(x-2)(x-9)(x-13)}{(7-2)(7-9)(7-13)} + \\ \frac{22(x-2)(x-7)(x-13)}{(9-2)(9-7)(9-13)} + \frac{95(x-2)(x-7)(x-9)}{(13-2)(13-7)(13-9)}$$

$$2) \quad x_0 = 1 \quad f[x_0] = \boxed{2}$$

$$x_1 = 3 \quad f[x_1] = \boxed{5}$$

$$x_2 = 4 \quad f[x_2] = \boxed{3}$$

$$x_3 = 7 \quad f[x_3] = \boxed{-2}$$

$$f[x_0, x_1] = \boxed{\frac{3}{2}}$$

$$f[x_1, x_2] = \boxed{-2}$$

$$f[x_2, x_3] = \boxed{-\frac{5}{3}}$$

$$f[x_0, x_1, x_2] = \boxed{-\frac{7}{6}}$$

$$f[x_1, x_2, x_3] = \boxed{\frac{1}{12}}$$

$$f[x_0, x_1, x_2, x_3] = \boxed{\frac{5}{24}}$$

3)

$$a_0 + 3b_0 + 9c_0 + 27d_0 = 7$$

$$a_0 + 5b_0 + 25c_0 + 125d_0 = -2$$

$$b_0 + 6c_0 + 27d_0 = 4$$

$$b_0 + 10c_0 + 75d_0 = -3$$

} Using
 $x_0 = 0$
for ease

4) void print_derivative(double poly[], int length) {

printf("%o/f x^%d", (length-1)*poly[length-1],
length-2);

int i;

for (i=length-2; i>0; i--) {

printf("+ %o/f x^%d", i*poly[i], i-1);
}

}

3) ALT Sol $x_0 = 3$

$$a_0 = 7, \quad a_0 + 2b_0 + 4c_0 + 8d_0 = -2$$

$$b_0 = 4, \quad b_0 + 4c_0 + 12d_0 = -3$$