1997 BC2

$P(x) = 7 - 3(x-4) + 5(x-4)^2 - 2(x-4)^3 + 6(x-4)^4$

a) $\boxed{f(4) = 7}$ $\qquad \dfrac{f'''(4)}{3!} = -2$

$\boxed{f'''(4) = -12}$

b) $P_3(x) = 7 - 3(x-4) + 5(x-4)^2 - 2(x-4)^3$

$P_3'(x) = -3 + 10(x-4) - 6(x-4)^2$

$f'(4.3) = -3 + 10(4.3-4) - 6(4.3-4)^2 = -.54$

c) $g(x) = \int_4^x f(t)\,dt$

$= \boxed{7(x-4) - \frac{3}{2}(x-4)^2 + \frac{5}{3}(x-4)^3 - \frac{1}{2}(x-4)^4}$

d) No. The information given provides values for $f(4)$, [illegible]

1995 BC4

$f(1) = 3 \quad f'(1) = -2 \quad f''(1) = 2 \quad f'''(1) = 4$

a) $3/0! = 3$ $\qquad P_2 = 3 - 2(x-1) + 1(x-1)^2$

$-2/1! = -2$ $\qquad P_2(.7) = 3 + .6 + .09 = \boxed{3.69}$

$2/2! = 1$

b) $P_3 = 3 - 2(x-1) + (x-1)^2 + \frac{2}{3}(x-1)^3$

$P_3(1.2) = 3 - .4 + .04 + \frac{2}{3}(.008) = \boxed{2.645}$

c) $P_3' = -2 + 2(x-1) + 2(x-1)^2$

$P'(1.2) = -2 + .4 + .08 = \boxed{-1.52}$