P119.

5. ~~$P_{0,0}=\frac{1}{9}$~~ $P_{0,0}=\frac{1}{9}$

$P_{1,0}=\frac{1}{3}$ $P_{0,1}=\frac{2}{9}x+\frac{5}{9}$ $P_{0,1,2}=\frac{1}{9}x^2+\frac{8}{9}x+1$

$P_{2,0}=1$ $P_{1,2}=\frac{1}{3}x+1$ $P_{1,2,3}=\frac{2}{3}x^2+\frac{4}{3}x+1$

$P_{3,0}=3$ $P_{2,3}=2x+1$ $P_{2,3,4}=2x^2+1$ $P_{0,1,2,3}=\frac{4}{27}x^3+\frac{2}{3}$

$P_{4,0}=9$ $P_{3,4}=6x-3$ ↓ $P_{1,2,3,4}=\frac{4}{9}x^3+\frac{2}{3}x^2+$

$P=\frac{2}{27}x^4+\frac{8}{27}x^3+\frac{16}{27}x^2+\frac{28}{27}x+1$

$\therefore P(\frac{1}{2})=1.70833$

7. $R_1(x)=\left|\frac{f^{(2)}(\xi)}{2!}(x-x_k)(x-x_{k+1})\right|$ $R_1(x)=\left|\frac{1}{2\xi^2\ln 10}(x-x_k)(x-x_{k+1})\right|\le\frac{1}{2\ln 10}$

$x_k=x_0+kh$ $\therefore h<0.004429$

$f(x)=\lg x$ $\therefore$ 0.04 is a good choice.

$x_0=1$

31.

(a) $f_{0,1}=1.107$

$f_{1,2}=1.352$ $f_{0,1,2}=0.613$

$f_{2,3}=1.652$ $f_{1,2,3}=0.749$ $f_{0,1,2,3}=0.226$

$f_{2,4}=2.017$ $f_{2,3,4}=0.914$ $f_{0,2,3,4}=0.276$

$f_{0,1,2,3,4}(0.05)=1.05126$

(b) $f(0.65)=1.91555$.

$f[x_0x_1]=5$. $f[x_1]=3$ $f[x_0]=1$