Differentieer oefening 4 Antwoorden

a. $f'(x)=\lim_{b\to 0}\frac{(x+b)^4-x^4}{b}=\lim_{b\to 0}4x^3+6x^2b+4xb^2+b^3=4x^3$

b $f'(x)=\lim_{b\to 0}\frac{(x+b)^2-(x+b)-x^2+x}{b}=\lim_{b\to 0}\frac{x^2+2bx+b^2-x-b-x^2+x}{b}$

$=\lim_{b\to 0}2x-1+b=2x-1$

$f'(x)=\lim_{b\to 0}\frac{(x+b)^3-(x+b)^2-x^3+x^2}{b}=$

c $\lim_{b\to 0}\frac{x^3+3x^2b+3xb^2+b^3-x^2-2bx-b^2-x^3+x^2}{b}$

$\lim_{b\to 0}3x^2+3xb+b^2-2x-b=3x^2-2x$

d $f'(x)=\lim_{b\to 0}\frac{\frac{1}{x+b}-\frac{1}{x}}{b}=\lim_{b\to 0}\frac{\frac{x-(x+b)}{x(x+b)}}{b}=\lim_{b\to 0}\frac{-b}{bx(x+b)}=\frac{-1}{x^2}$

e.

$f'(1)=\lim_{\Delta x\to 0}\frac{f(1+\Delta x)-f(1)}{\Delta x}=\lim_{\Delta x\to 0}\frac{1-2.(1+\Delta x)^2-(-1)}{\Delta x}=\lim_{\Delta x\to 0}\frac{-4\Delta x-2\Delta x^2}{\Delta x}=\lim_{\Delta x\to 0}-4-2\Delta x=-4$

a. $f(x)=\frac{1}{\sqrt{2x}}\Rightarrow f'(x)=\frac{1}{\sqrt{2}}.-\frac{1}{2}.x^{-1\frac{1}{2}}$

b. $G=\frac{4X+1}{X}=4+X^{-1}\Rightarrow G'=-1.X^{-2}$

c. $Y=\sqrt{1-A}\Rightarrow Y'=\frac{1}{2}.(1-A)^{-\frac{1}{2}}.-1$

d. K = B.sinB $K'=\sin B+B.\cos B$

e. $R=\frac{5}{3E}\Rightarrow R'=\frac{5}{3}.-1.E^{-2}$

f. $S=\sqrt{2p}(p-3p^2)=\sqrt{2}.p^{1\frac{1}{2}}-3\sqrt{2}.p^{2\frac{1}{2}}\Rightarrow S'=1\frac{1}{2}.\sqrt{2}.p^{\frac{1}{2}}-5\sqrt{2}.p^{1\frac{1}{2}}$