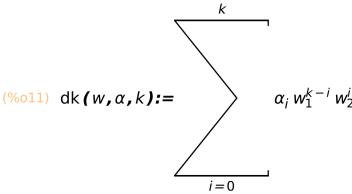
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```
(%i18) grad(F, x):=[diff(F(x), x[1]), diff(F(x), x[2])];
(%018) grad (F, x) := [\frac{d}{dx_1} F(x), \frac{d}{dx_2} F(x)]
(\%i25) fpx:[x=0, y=0];
        xhat:[x, y];
        yhat:[z];
        A:matrix([0, -1], [1, 0]);
        f(xhat, yhat) := [xhat[1]\cdot yhat - xhat[1]^4, xhat[2]\cdot yhat + xhat[1]\cdot xhat[2]\cdot yhat];
        B:-1;
        g(xhat, yhat) := [-(xhat[1]^2 + xhat[2]^2) + yhat^2 + sin(xhat[1]^3)];
(fpx) [x = 0, y = 0]
(xhat) [x,y]
(yhat) [z]
(%023) f(xhat, yhat) := [xhat_1 yhat - xhat_1^4, xhat_2 yhat + xhat_1]
        xhat<sub>2</sub> yhat ]
        -1
(%025) g(xhat,yhat):=[-(xhat<sub>1</sub><sup>2</sup> + xhat<sub>2</sub><sup>2</sup>) + yhat + sin(xhat<sub>1</sub><sup>3</sup>)]
(\%i12) M(F):=grad(F, xhat).(A.xhat + f(xhat, F(xhat))) - B.F(xhat) - g(xhat, F(xhat));
        Mp(pk, dkp1):=grad(dkp1, xhat).(A.xhat) - B.dkp1(xhat) + (grad(pk, xhat).(A.xhat)
        dk(w, \alpha, k) := sum(\alpha[i] \cdot w[1]^{(k-i)} \cdot w[2]^{i}, i, 0, k);
        generate_equations(poly, k):=makelist(at(ratcoeff(poly, x^{(k-i)\cdot y^i)}, fpx), i, 0, k)
(\%09) M(F):=grad(F,xhat).(A.xhat+f(xhat,F(xhat)))-B.
        F(xhat)-g(xhat,F(xhat))
```



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