```
> with(qseries):
>
> with(thetaids):
> F1:=theta2(q,100)^4:
> F2:=theta3(q,100)^4:
> F3:=theta4(q,100)^4:
> findhom([F1,F2,F3],q,1,0);
```

$$\{X_1 - X_2 + X_3\} \qquad (1)$$

```
> JACID0:=qs2jaccombo(F1-F2+F3,q,100);
```

$$JACID0 := \frac{16\, q\, JAC(0, 4, \infty)^6}{JAC(2, 4, \infty)^2} - \frac{JAC(0, 4, \infty)^6\, JAC(2, 4, \infty)^6}{JAC(1, 4, \infty)^8} + JAC(1, 2, \infty)^4 \qquad (2)$$

```
> JACID1:=processjacid(JACID0);
```

$$JACID1 := -\frac{16\, q\, JAC(1, 4, \infty)^8}{JAC(2, 4, \infty)^8} + 1 - \frac{JAC(1, 4, \infty)^{16}}{JAC(0, 4, \infty)^{12}\, JAC(2, 4, \infty)^4} \qquad (3)$$

```
> SYMID1:=expand(jac2getaprod(JACID1));
```

$$SYMID1 := -\frac{\eta_{4,1}(\tau)^{16}}{\eta_{4,2}(\tau)^4} + 1 - \frac{16\, \eta_{4,1}(\tau)^8}{\eta_{4,2}(\tau)^8} \qquad (4)$$

```
> printlocalsymid:=true:
>
> provemodfuncidBATCH(SYMID1,JACID1,4);
```

```
*** There were NO errors.  Each term was modular function on
    Gamma1(4). Also -mintotord=1. To prove the identity
    we need to  check up to O(q^(3)).
    To be on the safe side we check up to O(q^(9)).
*** The identity below is PROVED!
```

$$-\frac{\eta_{4,1}(\tau)^{16}}{\eta_{4,2}(\tau)^4} + 1 - \frac{16\, \eta_{4,1}(\tau)^8}{\eta_{4,2}(\tau)^8}$$

$$1 \qquad (5)$$