

```
> with(ETA);
[Ffind, Fricke, GPmake, POWERPq, POWERPqMODP, POWERq, POWERqMODP, UpLB,
 cuspORD, cuspORDS, cuspORDSnotoo, cuspmake, cuspcord, etaCOF, etaCONSTANT,
 etaWe, etamult, etanormalid, etaprodWe, etaprodtoqseries, etaprodtoqseries2,
 etaprodtoqseriesMODP, fanwidth, gammacheck, gammacheckM, gp2etaprod, jacobstar,
 jactopstar, mintotGAMMA0ORDS, printcuspORDS, printcuspords,
 provemodfuncGAMMA0id, vetainf, vp]
```

```
> cuspmake(56);
```

$$\left\{0, \frac{1}{2}, \frac{1}{4}, \frac{1}{7}, \frac{1}{8}, \frac{1}{14}, \frac{1}{28}, \frac{1}{56}\right\}$$

```
> nops(%);
```

8

```
> EP:=eta(7*tau)^2*eta(4*tau)^5*eta(14*tau)*eta(56*tau)^2/(eta
(tau)^2*eta(8*tau)^2*eta(2*tau)*eta(28*tau)^5);
```

$$EP := \frac{\eta(7\tau)^2 \eta(4\tau)^5 \eta(14\tau) \eta(56\tau)^2}{\eta(\tau)^2 \eta(8\tau)^2 \eta(2\tau) \eta(28\tau)^5}$$

```
> GP:=GPmake(EP);
```

$GP := [7, 2, 4, 5, 14, 1, 56, 2, 1, -2, 8, -2, 2, -1, 28, -5]$

```
> gammacheck(GP,56);
```

1

This means that the eta-product above is a modular function on $\Gamma_0(56)$.

```
> printcuspORDS(EP,56);
```

$cusp =, 0, order =, -\frac{3}{56}, ORD =, -3$

$cusp =, \frac{1}{2}, order =, 0, ORD =, 0$

$cusp =, \frac{1}{4}, order =, \frac{3}{7}, ORD =, 3$

$cusp =, \frac{1}{7}, order =, \frac{3}{8}, ORD =, 3$

$cusp =, \frac{1}{8}, order =, 0, ORD =, 0$

$cusp =, \frac{1}{14}, order =, 0, ORD =, 0$

$cusp =, \frac{1}{28}, order =, -3, ORD =, -3$

$cusp =, \frac{1}{56}, order =, 0, ORD =, 0$

$TOT ORD =, 0$

```
> cuspORDS(EP, cuspmake(56), 56);
```

$$\left[[0, -3], \left[\frac{1}{2}, 0\right], \left[\frac{1}{4}, 3\right], \left[\frac{1}{7}, 3\right], \left[\frac{1}{8}, 0\right], \left[\frac{1}{14}, 0\right], \left[\frac{1}{28}, -3\right], \left[\frac{1}{56}, 0\right] \right] \quad (8)$$