```
> restart:with(Student[MultivariateCalculus]):
> LagrangeMultipliers(x*y*z,[2*x*z+2*y*z+x*y-12],[x,y,z],output=deta
  iled);
```

$$\left[x = 2, y = 2, z = 1, \lambda_1 = \frac{1}{2}, x\,y\,z = 4\right], \left[x = -2, y = -2, z = -1, \lambda_1 = \frac{-1}{2}, x\,y\,z = -4\right]$$

```
> with(Student[MultivariateCalculus]):
> LagrangeMultipliers(x^2+2*y^2,[x^2+y^2-1],[x,y],output=detailed);
```

$$[x = 0, y = 1, \lambda_1 = 2, x^2 + 2\,y^2 = 2], [x = 0, y = -1, \lambda_1 = 2, x^2 + 2\,y^2 = 2],$$

$$[x = 1, y = 0, \lambda_1 = 1, x^2 + 2\,y^2 = 1], [x = -1, y = 0, \lambda_1 = 1, x^2 + 2\,y^2 = 1]$$

```
> with(Student[MultivariateCalculus]):
> LagrangeMultipliers(x+2*y+3*z,[x^2+y^2-1,x-y+z-1],[x,y,z],output =
  detailed);evalf(%);
```

$$\left[x = -2\,\mathrm{RootOf}(29\,\_Z^2 - 1, label = \_L1), y = 5\,\mathrm{RootOf}(29\,\_Z^2 - 1, label = \_L1),\right.$$

$$z = 7\,\mathrm{RootOf}(29\,\_Z^2 - 1, label = \_L1) + 1, \lambda_1 = \frac{29}{2}\,\mathrm{RootOf}(29\,\_Z^2 - 1, label = \_L1), \lambda_2 = 3,$$

$$\left.x + 2\,y + 3\,z = 29\,\mathrm{RootOf}(29\,\_Z^2 - 1, label = \_L1) + 3\right]$$

$$[x = -0.3713906764, y = 0.9284766910, z = 2.299867367, \lambda_1 = 2.692582404, \lambda_2 = 3.,$$

$$x + 2.\,y + 3.\,z = 8.385164808]$$

```
>
```