In[7]:=

```
FullSimplify[Assuming[u > 0 && f > 0 && v > 0, Inverse[
  ( f^2 + u^2     -2 * u^2           u^2                          0                  0
    -2 * u^2      f^2 + 5 * u^2      -u * (3 * u + v)             u * v              0
    u^2           -u * (3 * u + v)   f^2 + 2 * (u^2 + v^2 + u * v)  -v * (u + 3 * v)   v^2
    0             u * v              -v * (u + 3 * v)             g^2 + 6 * v^2      -v * (3 * v +
    0             0                  v^2                          -v * (3 * v + u)   f^2 + 2 * (u^2 + v^
    0             0                  0                            u * v              -u * (3 * u +
    0             0                  0                            0                  u^2
  )]][[4, 4]]]
```

Out[7]=

$$\left(f^6 + 2\,u^4\,v^2 + f^4\,\left(8\,u^2 + 2\,u\,v + 3\,v^2\right) + f^2\,u^2\,\left(3\,u^2 + 6\,u\,v + 17\,v^2\right)\right) \Big/ \left(2\,g^2\,u^4\,v^2 + f^6\,\left(g^2 + 6\,v^2\right) + f^4\,\left(44\,u^2\,v^2 + g^2\,\left(8\,u^2 + 2\,u\,v + 3\,v^2\right)\right) + f^2\,u^2\,\left(12\,u^2\,v^2 + g^2\,\left(3\,u^2 + 6\,u\,v + 17\,v^2\right)\right)\right)$$