

## Corollary 5.12 (Class 10)

June 19, 2015

```
# parametrize the slack matrix

R.<x1,x2,x3,x4,x5,x6,x7,x8,x9,x10,x11,x12,x13,x14,x15,x16,x17,x18,x19,x20\
  >=QQ[];

M = matrix(R,[
  [ 0, 0, x1, x2, 0, 0, x3],
  [ 0, x4, 0, x5, 0, 0, 0],
  [ 0, 0, 0, x6, 0, x7, x8],
  [ x9, 0,x10, 0, 0, 0, 0],
  [x11, 0, 0, 0, 0,x12, 0],
  [ 0, 0,x13, 0,x14, 0,x15],
  [ 0,x16, 0, 0,x17, 0, 0],
  [ 0, 0, 0, 0,x18,x19,x20]
]);

J=ideal(M.minors(6));
JJ = ideal(x1*x2*x3*x4*x5*x6*x7*x8*x9*x10*x11*x12*x13*x14*x15*x16*x17*x18\
  *x19*x20);
J = ideal(M.minors(6));
JJ = ideal(x1*x2*x3*x4*x5*x6*x7*x8*x9*x10*x11*x12*x13*x14*x15*x16*x17*x18\
  *x19*x20);
KK=J.saturation(JJ);
for c in KK[0].gens():
  print(c)
x8*x19 - x7*x20
x15*x18 - x14*x20
x3*x13 - x1*x15
x3*x6 - x2*x8
x2*x8*x13 - x1*x6*x15
x10*x11*x15*x19 - x9*x12*x13*x20
x1*x6*x15*x19 - x2*x7*x13*x20
x3*x10*x11*x19 - x1*x9*x12*x20
x5*x8*x16*x18 - x4*x6*x17*x20
x5*x7*x16*x18 - x4*x6*x17*x19
x3*x5*x16*x18 - x2*x4*x17*x20
x9*x12*x13*x18 - x10*x11*x14*x19
x2*x7*x13*x18 - x1*x6*x14*x19
x5*x8*x14*x16 - x4*x6*x15*x17
x3*x5*x14*x16 - x2*x4*x15*x17
```

```

x1*x5*x14*x16 - x2*x4*x13*x17
x8*x9*x12*x13 - x7*x10*x11*x15
x3*x7*x10*x11 - x1*x8*x9*x12
x2*x7*x10*x11 - x1*x6*x9*x12
x4*x6*x15*x17*x19 - x5*x7*x14*x16*x20
x1*x5*x9*x12*x16*x18 - x2*x4*x10*x11*x17*x19
x5*x7*x10*x11*x14*x16 - x4*x6*x9*x12*x13*x17

```

```

# the ideal K is binomial since all the gerenerators are

```

```

# x8*x19 - x7*x20
# x15*x18 - x14*x20
# x3*x13 - x1*x15
# x3*x6 - x2*x8
# x2*x8*x13 - x1*x6*x15
# x10*x11*x15*x19 - x9*x12*x13*x20
# x1*x6*x15*x19 - x2*x7*x13*x20
# x3*x10*x11*x19 - x1*x9*x12*x20
# x5*x8*x16*x18 - x4*x6*x17*x20
# x5*x7*x16*x18 - x4*x6*x17*x19
# x3*x5*x16*x18 - x2*x4*x17*x20
# x9*x12*x13*x18 - x10*x11*x14*x19
# x2*x7*x13*x18 - x1*x6*x14*x19
# x5*x8*x14*x16 - x4*x6*x15*x17
# x3*x5*x14*x16 - x2*x4*x15*x17
# x1*x5*x14*x16 - x2*x4*x13*x17
# x8*x9*x12*x13 - x7*x10*x11*x15
# x3*x7*x10*x11 - x1*x8*x9*x12
# x2*x7*x10*x11 - x1*x6*x9*x12
# x4*x6*x15*x17*x19 - x5*x7*x14*x16*x20
# x1*x5*x9*x12*x16*x18 - x2*x4*x10*x11*x17*x19
# x5*x7*x10*x11*x14*x16 - x4*x6*x9*x12*x13*x17

```