```
> g := 2*x-3;
```

$$g := 2\,x - 3 \tag{1}$$

```
> a := expand( g*randpoly(x,dense,degree=5) );
```

$$a := -14\,x^6 + 65\,x^5 - 176\,x^4 - 23\,x^3 + 456\,x^2 - 373\,x + 168 \tag{2}$$

```
> b := expand( g*randpoly(x,dense,degree=5) );
```

$$b := -124\,x^5 + 380\,x^4 - 437\,x^3 + 211\,x^2 - 154\,x + 249 \tag{3}$$

```
> gcd(a,b);
```

$$2\,x - 3 \tag{4}$$

```
> m := lcoeff(b,x)^2;
```

$$m := 15376 \tag{5}$$

```
> rem(m*a,b,x);
```

$$-906344\,x^4 - 1917324\,x^3 + 7856940\,x^2 - 6589472\,x + 3265428 \tag{6}$$

```
> prem(a,b,x);
```

$$-906344\,x^4 - 1917324\,x^3 + 7856940\,x^2 - 6589472\,x + 3265428 \tag{7}$$

```
> content(a,x);
```

$$1 \tag{8}$$

```
> content(b,x);
```

$$1 \tag{9}$$

The primitive Euclidean algorithm in $\mathbb{Z}[x]$

```
> r[0] := a;
  r[1] := b;
  k := 1:
  while r[k] <> 0 do # the primitive Euclidean algorithm in Z[x]
      r[k+1] := primpart( prem(r[k-1],r[k],x), x );
      print( evaln(r[k+1]) = r[k+1] );
      k := k+1;
  od:
  n := k-1;
  gcd = primpart( r[n], x );
```

$$r_0 := -14\,x^6 + 65\,x^5 - 176\,x^4 - 23\,x^3 + 456\,x^2 - 373\,x + 168$$

$$r_1 := -124\,x^5 + 380\,x^4 - 437\,x^3 + 211\,x^2 - 154\,x + 249$$

$$r_2 = -226586\,x^4 - 479331\,x^3 + 1964235\,x^2 - 1647368\,x + 816357$$

$$r_3 = -9585474986\,x^3 + 22307021423\,x^2 - 17598916464\,x + 8558554572$$

$$r_4 = 67355561565652\,x^2 - 2682736267844\,x - 147525909120951$$

$$r_5 = -2\,x + 3$$

$$r_6 = 0$$

$$n := 5$$

$$gcd = -2\,x + 3 \tag{10}$$