```
> restart;
> P := x^2:
  Q := x^5-3*x^4+x^3+5*x^2-6*x+2:
> sqrfree(Q);
```
$$[1, [[x^2 - 2, 1], [x - 1, 3]]]$$

```
> T := (x^2-2); k := 3; qk := x-1;
```
$$T := x^2 - 2$$
$$k := 3$$
$$qk := x - 1$$

```
> sigma*T*diff(qk,x) + tau*qk = P;
```
$$\sigma\left(x^2 - 2\right) + \tau\left(x - 1\right) = x^2$$

```
> gcdex(T*diff(qk,x),qk,P,x,'sigma','tau');
> sigma;
```
$$-1$$

```
> tau;
```
$$2 + 2x$$

```
> INT := sigma/qk^(k-1)/(1-k) + Int( tau/T/qk^(k-1), x ):
> Int( P/factor(Q), x ) = INT;
```
$$\int \frac{x^2}{\left(x^2 - 2\right)\left(x - 1\right)^3}\, dx = \frac{1}{2\left(x - 1\right)^2} + \int \frac{2 + 2x}{\left(x^2 - 2\right)\left(x - 1\right)^2}\, dx$$

```
> simplify( diff(INT,x)-P/Q );
```
$$0$$

```
> P := tau;
  Q := qk^(k-1)*T;
```
$$P := 2 + 2x$$
$$Q := \left(x^2 - 2\right)\left(x - 1\right)^2$$

```
> T := (x^2-2); k := 2; qk := x-1;
```
$$T := x^2 - 2$$
$$k := 2$$
$$qk := x - 1$$

```
> gcdex(T*diff(qk,x),qk,P,x,'sigma','tau');
> sigma;
```
$$-4$$

```
> tau;
```
$$6 + 4x$$

```
> INT := sigma/qk^(k-1)/(1-k) + Int( tau/T/qk^(k-1), x ):
```

Int(P/Q, x) = INT;

$$\int \frac{2+2\,x}{\left(x^2-2\right)\,(x-1)^2}\;\mathrm{d}x = \frac{4}{x-1} + \int \frac{6+4\,x}{\left(x^2-2\right)\,(x-1)}\;\mathrm{d}x$$