```
D[1 / ((x^2 - 1)^2 + x^2 / Q^2), x]
```

$$-\frac{\frac{2x}{Q^2} + 4x\left(-1 + x^2\right)}{\left(\frac{x^2}{Q^2} + \left(-1 + x^2\right)^2\right)^2}$$

```
Solve[% == 0, x]
```

$$\left\{\{x \to 0\}, \left\{x \to -\frac{\sqrt{-1 + 2Q^2}}{\sqrt{2}\,Q}\right\}, \left\{x \to \frac{\sqrt{-1 + 2Q^2}}{\sqrt{2}\,Q}\right\}\right\}$$

```
1 / ((x^2 - 1)^2 + x^2 / Q^2) /. x → Sqrt[-1 + 2 Q^2] / (Sqrt[2] Q)
```

$$\frac{1}{\frac{-1+2Q^2}{2Q^4} + \left(-1 + \frac{-1+2Q^2}{2Q^2}\right)^2}$$

```
Simplify[%]
```

$$\frac{4Q^4}{-1 + 4Q^2}$$

```
Series[(x^2 - 1)^2 + x^2 / Q^2, {x, Sqrt[1 - 1 / 2 / Q^2], 4}]
```

$$\left(-\frac{1}{4Q^4} + \frac{1}{Q^2}\right) + \left(4 - \frac{2}{Q^2}\right)\left(x - \sqrt{1 - \frac{1}{2Q^2}}\right)^2 +$$

$$4\sqrt{1 - \frac{1}{2Q^2}}\left(x - \sqrt{1 - \frac{1}{2Q^2}}\right)^3 + \left(x - \sqrt{1 - \frac{1}{2Q^2}}\right)^4 + O\left[x - \sqrt{1 - \frac{1}{2Q^2}}\right]^5$$