```
$Assumptions = a > 0;

p[q_] := -q μ - a (vp + 2 q cov + q² vs)

q' = Solve[D[p[q], q] == 0, q][[1, 1, 2]]
```

$$\frac{-2\ a\ cov - \mu}{2\ a\ vs}$$

```
Simplify[p[q'] - μ² / 4 / a / vs]
```

$$\frac{a\ cov^2 - a\ vp\ vs + cov\ \mu}{vs}$$

```
Simplify[p[q'] /. {vp → (Δ σ S)², vs → (σ S)², cov → Δ (σ S)², μ → m S}]
```

$$m\ S\ \Delta + \frac{m^2}{4\ a\ \sigma^2}$$