The condition that $x^3+px+q=0$ have a rational root is essential, for $x^3-6x-6=0$ has $\Delta=1$ but has no rational roots and none of its roots are in $Q[\omega]$.

Final note. All of these results may be proved by elementary means. For example, it is only moderately difficult to prove Theorem 1 by noting that if x_1 is the rational root, then

$$\left(\frac{x_1}{2}-\frac{3x_1}{3q+2px_1}\sqrt{\Delta}\right)^3=-\frac{q}{2}+\sqrt{\Delta},$$

which gives an $H\in Q[\sqrt{\Delta}]$. However, this method is unsystematic and makes the results seem to depend on fortuitous algebraic trivialities. The approach through field extensions gives a much better explanation of what is really going on.

REFERENCES

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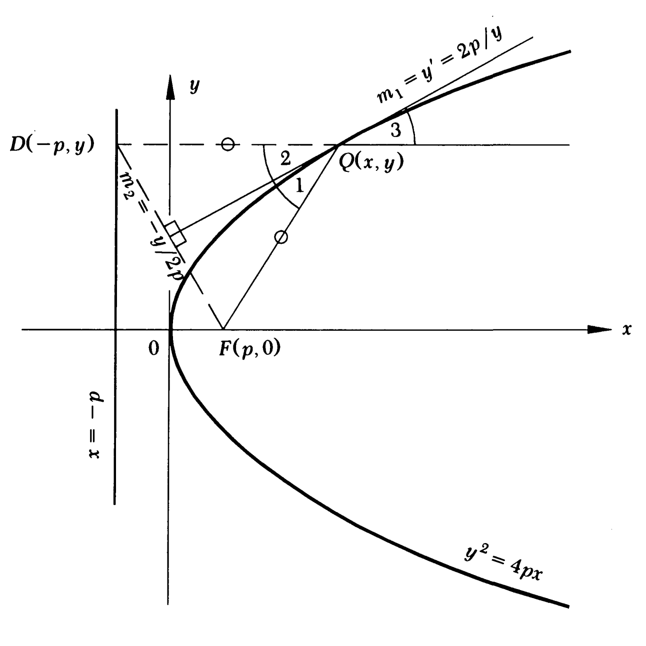
Proof without Words: The reflection property of the parabola



$$QF=QD \quad \& \quad m_1\cdot m_2=-1 \quad \Rightarrow \quad \measuredangle 1=\measuredangle 2=\measuredangle 3$$

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