Chapter 6 exercises

1. Implement a `HestonAsset` class (for options in a Heston model) with an interface similar to the existing class `BlackScholesAsset`.

   (a) Which public member functions of `BlackScholesAsset` make sense for a `HestonAsset`?

   (b) In particular, implement the member function for pricing standard options in a Heston model.

2. Implement the method of Kahalé for constructing an implied volatility surface, as described in Section 6.2.

3. Taking the parameters (i.e. sigma, skewness and excess kurtosis) of column $m = 4$ in Table 6.2 as a starting point, vary these parameters and observe their impact on at–the–money, risk reversal and butterfly implied volatilities. Is there any correspondence between which parameter is varied and which of at–the–money, risk reversal and butterfly implied volatilities are most affected?