12.1 The number of dice per wafer is

$$N_{Dice} \approx \pi(\frac{D_w}{2L_c} - 1)^2 = \pi(\frac{8 \cdot 25.4}{2\,L_c} - 1)^2 = 561,\ 263,\ \text{and } 167 \text{ dice.}$$

The active area d is close to 1 for a high-density chip. Thus, $d\,A\,D \approx$ 0.95 A 0.03 > 1. Hence, we use Murphy-Moores model for the yield

$$Y = 0.5 \left[\frac{1 - e^{-dAD}}{dAD}\right]^2 + 0.5\ e^{-\sqrt{dAD}}$$

We have: $d\,A\,D$ = 1.425, 2.85, and 4.275. The yield is estimated to: 29.4%, 14.7%, and 9.0%.

The cost is estimated to: \$600 Y/N_{dice} = \$4.66, \$15.52, and \$39.92 per die. Further, costs for testing, bounding, and packaging are incurred. For a small die, the cost of the package may be dominant.