

12.

$$q=20, AC-AVC=AFC=10 \rightarrow FC=AFC \times q = 10 \times 20 = 200$$

$$q=40, AC-AVC=AFC=FC/q = 200/40 = 5$$

13.

$$VC(10) = \int_0^{10} 10q^2 dq = 5q^3 \Big|_0^{10} = 5000$$

$$TC = VC + FC = 5000 + 100 = 6000$$