5. (20 points). Consider an economy where the central bank imposes a required reserve ratio of 20%. Bank deposits at the central bank = $150 million; Currency held by public = $200 million; Currency in bank vaults = $150 million; Checkable bank deposits = $600 million; and Traveler’s checks = $20 million.

a. What is M1?

\[ M_1 = \text{currency held by public} + \text{checkable deposits} + \text{traveler's checks} \]
\[ = $200 + $600 + $20 = $820 \text{ million} \]

b. What is the monetary base?

\[ \text{Monetary base} = \text{currency in circulation} + \text{reserves} + \text{bank vaults} \]
\[ = $200 + $150 + $150 \]
\[ = $500 \text{ million} \]

c. How much are the excess reserves held by the commercial banks?

\[ \text{Required reserves} = 20\% \times \text{checkable deposits} = $120 \text{ million} \]
\[ \text{Excess reserves} = \$300 - \$120 = \$180 \text{ million} \]

d. Can the commercial banks increase checkable bank deposits? If yes, by how much can checkable bank deposits increase?

\[ \text{Yes, they can.} \]
\[ \text{Increase in checkable deposits} = \frac{1}{1 - 0.2} \times \$180 = \frac{1}{0.8} \times \$180 = \$700 \text{ million} \]