

# Integer Division

## 1. Restoring Division

## 2. Non-Restoring Division

$$\begin{array}{r} 21 \\ 13 \overline{)274} \\ \underline{26} \phantom{0} \\ 14 \phantom{0} \\ \underline{13} \phantom{0} \\ 1 \end{array}$$
$$\begin{array}{r} 10101 \\ 1101 \overline{)100010010} \\ \underline{1101} \phantom{000} \\ 10000 \phantom{0} \\ \underline{1101} \phantom{00} \\ 1110 \phantom{0} \\ \underline{1101} \phantom{0} \\ 1 \end{array}$$

Figure 6.20 Longhand division examples.

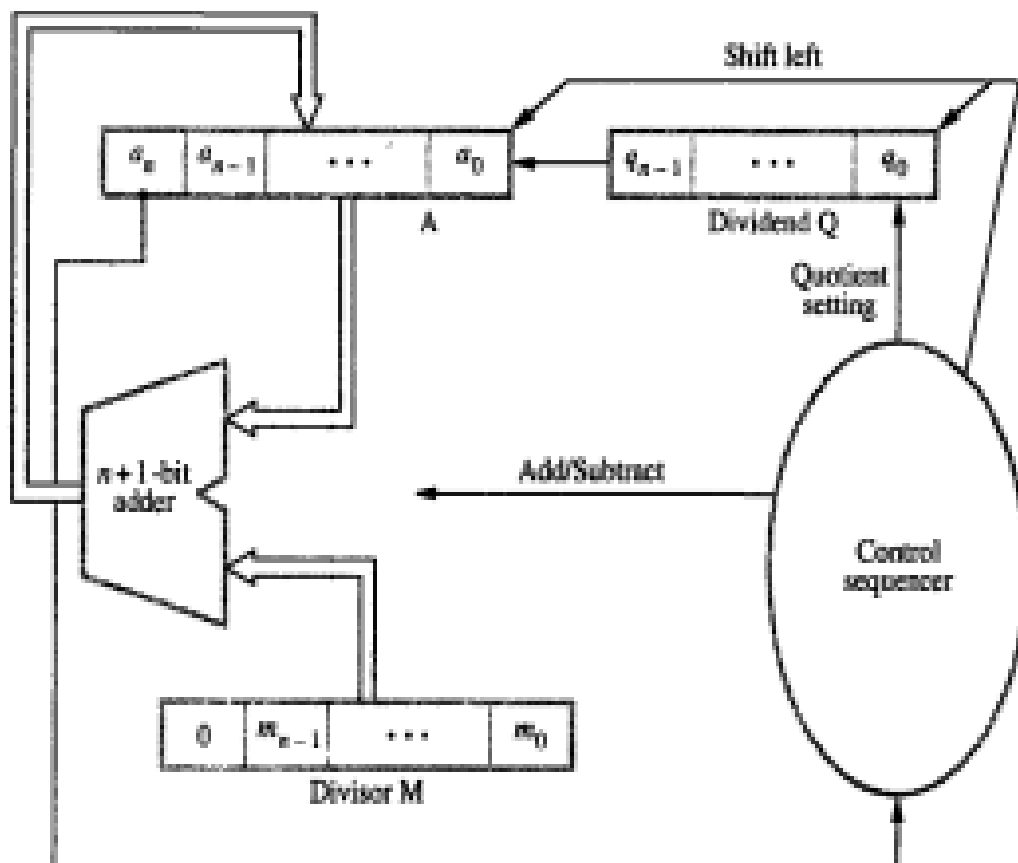


Figure 6.21 Circuit arrangement for binary division.

## Restoring Division

The following algorithm performs restoring division.

Do the following  $n$  times:

1. Shift A and Q left one binary position.
2. Subtract M from A, and place the answer back in A.
3. If the sign of A is 1, set  $q_0$  to 0 and add M back to A (that is, restore A); otherwise, set  $q_0$  to 1.

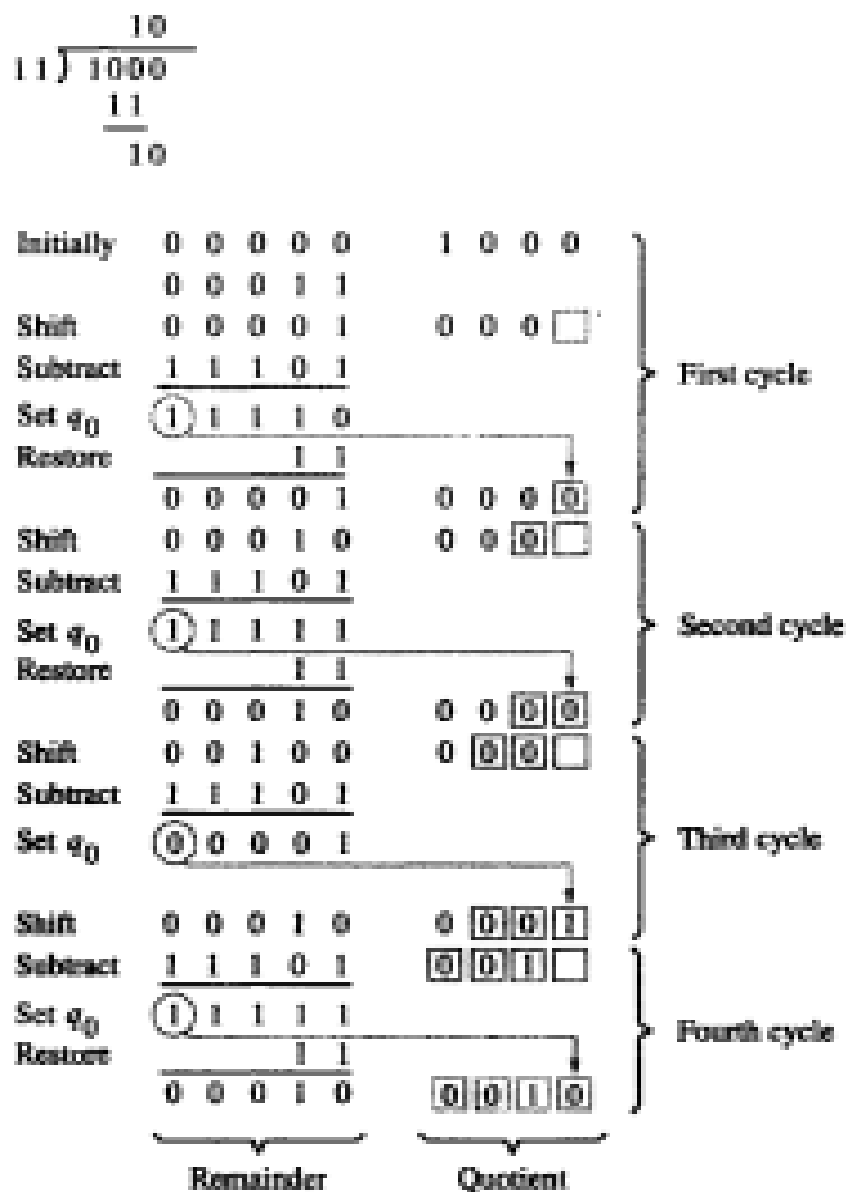


Figure 6.22 A restoring-division example.