

Exercise 67

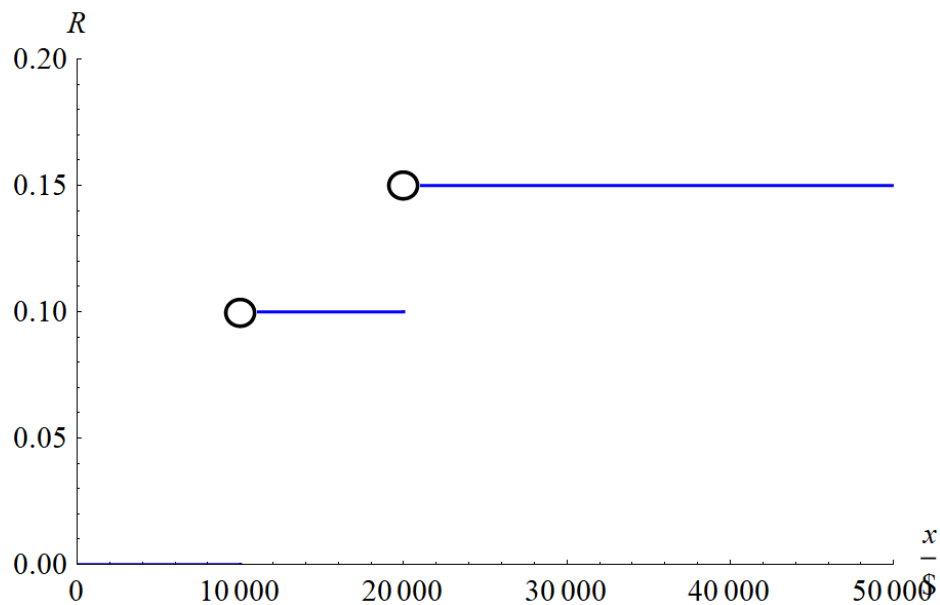
In a certain country, income tax is assessed as follows. There is no tax on income up to \$10,000. Any income over \$10,000 is taxed at a rate of 10%, up to an income of \$20,000. Any income over \$20,000 is taxed at 15%.

- Sketch the graph of the tax rate R as a function of the income I .
- How much tax is assessed on an income of \$14,000? On \$26,000?
- Sketch the graph of the total assessed tax T as a function of the income I .

Solution

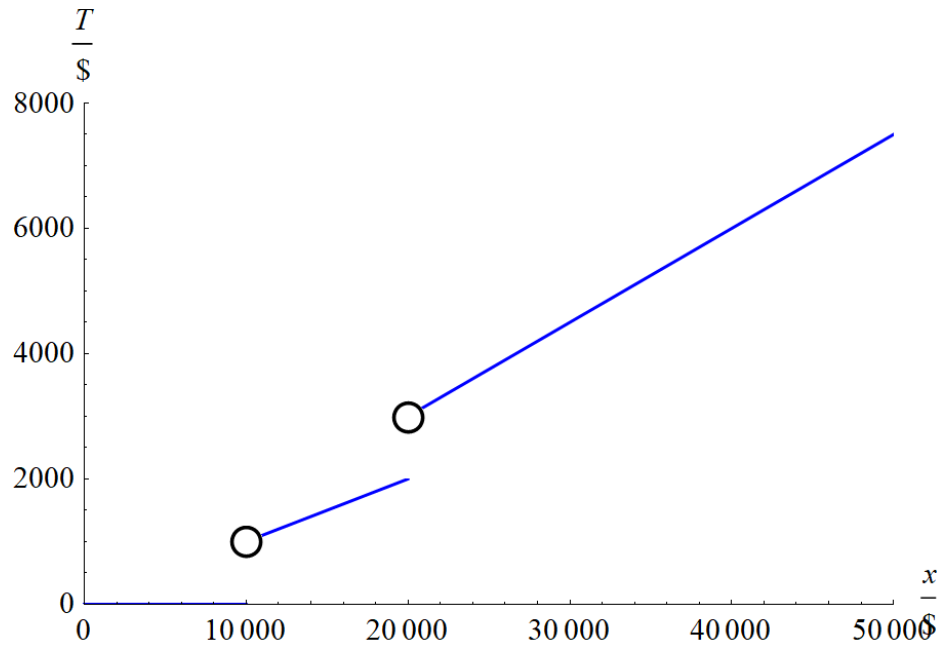
The tax rate can be modelled by

$$R(I) = \begin{cases} 0 & \text{if } 0 \leq I \leq 10\,000 \\ 0.1 & \text{if } 10\,000 < I \leq 20\,000 \\ 0.15 & \text{if } 20\,000 < I < \infty \end{cases}$$



The assessed tax is the income multiplied by the tax rate: $T(I) = IR(I)$.

$$T(I) = \begin{cases} 0 & \text{if } 0 \leq I \leq 10\,000 \\ 0.1I & \text{if } 10\,000 < I \leq 20\,000 \\ 0.15I & \text{if } 20\,000 < I < \infty \end{cases}$$



$$T(14\,000) = 0.1(14\,000) = 1400$$

$$T(26\,000) = 0.15(26\,000) = 3900$$