Section 1.4

4. Values of a linear cost function are in Table 1.18. What are the fixed costs and the variable cost per unit (the marginal cost)? Find a formula for the cost function.

Table 1.18

<table>
<thead>
<tr>
<th>( q )</th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>( C(q) )</td>
<td>5000</td>
<td>5020</td>
<td>5040</td>
<td>5060</td>
<td>5080</td>
</tr>
</tbody>
</table>

\[
C(q) = 4q + 5000
\]

9. A movie theater has fixed costs of $5000 per day and variable costs averaging $2 per customer. The theater charges $7 per ticket.

(a) How many customers per day does the theater need in order to make a profit?

(b) Find the cost and revenue functions and graph them on the same axes. Mark the break-even point.

(a) Revenue = 7x
Cost = 5000 + 2x
Profit = 7x - (5000 + 2x)
= 7x - 5000 - 2x
= 5x - 5000

Want \( P > 0 \)
5x - 5000 > 0
\[
x > 1000
\]

Must sell more than 1000 tickets to make a profit
Section 1.5

5. A product costs $80 today. How much will the product cost in \( t \) days if the price is reduced by:

(a) $4 a day

\[ C(t) = 80 - 4t \]

(b) 5% a day

\[ C(t) = 80(0.95)^t \]