4. **The accompanying table shows a car manufacturer’s total cost of producing cars.**



a. **What is this manufacturer’s fixed cost?**

b. **For each level of output, calculate the variable cost (*VC*). For each level of output except zero output, calculate the average variable cost (*AVC*), average total cost (*ATC*), and average fixed cost (*AFC*)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Qty of cars** | **TC** | **Variable Costs** | **Average Variable Costs** | **Average Total Costs** | **Average Fixed Costs** |
| **0** | $500,000 | - | - | - | - |
| **1** | 540,000 |  |  |  |  |
| **2** | 560,000 |  |  |  |  |
| **3** | 570,000 |  |  |  |  |
| **4** | 590,000 |  |  |  |  |
| **5** | 620,000 |  |  |  |  |
| **6** | 660,000 |  |  |  |  |
| **7** | 720,000 |  |  |  |  |
| **8** | 800,000 |  |  |  |  |
| **9** | 920,000 |  |  |  |  |
| **10** | 1,100,000 |  |  |  |  |

**What is the minimum-cost output?**

**c)**

**For each level of output, calculate this manufacturer’s marginal cost (*MC*)**

*(For convenience, place the Marginal Cost between 0 and 1 car on the second row, the Marginal Cost between 1 and 2 cars on the third row, and so on)*

|  |  |  |
| --- | --- | --- |
| **Qty of cars** | **TC** | **Marginal Costs** |
| **0** | $500,000 | - |
| **1** | 540,000 |  |
| **2** | 560,000 |  |
| **3** | 570,000 |  |
| **4** | 590,000 |  |
| **5** | 620,000 |  |
| **6** | 660,000 |  |
| **7** | 720,000 |  |
| **8** | 800,000 |  |
| **9** | 920,000 |  |
| **10** | 1,100,000 |  |

d. **On one diagram, draw the manufacturer’s *AVC*, *ATC*, and *MC* curves**



*Fill in the table. For convenience, Marginal Cost between 0 and 1 has been placed on the row associated with Q=1, Marginal Cost between 1 and 2 has been placed on the row associated with Q=2, etc.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Quantity** | **TC** | **Marginal Costs** | **Average Total Costs** | **Average Variable Costs** |
| 0 | $20 | - | - | - |
| 1 |  | $20 |  |  |
| 2 |  | 10 |  |  |
| 3 |  | 16 |  |  |
| 4 |  | 20 |  |  |
| 5 |  | 24 |  |  |

13. **True or False? Explain your reasoning.**

a. **The short-run average total cost can never be less than the long-run average total cost.**

b. **The short-run average variable cost can never be less than the long-run average total cost.**

c. **In the long run, choosing a higher level of fixed cost shifts the long-run average total cost curve upward.**