1. **Quality Control**

Eastsound operates round-trip flights between two cities using a fleet of three planes: the Viper, the Tiger, and the Eagle. The budgeted quantity of fuel for each round trip is the average fuel usage, which over the past 12 months has been 150 gallons. Eastsound has set the upper control limit at 180 gallons. The operations manager received the following report for round-trip fuel

usage for the period by the three planes.

|  |  |  |  |
| --- | --- | --- | --- |
| Trip | Viper | Tiger | Eagle |
| 1 | 156 | 155 | 146 |
| 2 | 141 | 141 | 156 |
| 3 | 146 | 144 | 167 |
| 4 | 152 | 161 | 156 |
| 5 | 156 | 138 | 183 |
| 6 | 161 | 170 | 177 |
| 7 | 167 | 149 | 189 |
| 8 | 186 | 159 | 171 |
| 9 | 173 | 152 | 176 |
| 10 | 179 | 140 | 185 |

a. Create quality control charts for round-trip fuel usage for each of the three planes for the period. What inferences can you draw from them?

b. Some managers propose that Eastsound present its quality control charts in monetary terms rather than in physical quantities (gallons). What are the advantages and disadvantages of using monetary fuel costs rather than gallons in the quality control charts?

2. **Cost behavior when costs are semi variable**

Data from the payroll department of Dominguez Company for the past two months follow:

|  |  |
| --- | --- |
| **Number of** **Employees Paid** | **Payroll** **department Costs** |

November . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . 6,000 $12,000

December . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 9,000 15,000

a. Sketch a line describing these costs as a function of the number of employees paid.

b. What is the apparent variable cost per employee paid?

c. The line should indicate that these costs are semi-variable. What is the apparent fixed cost per month of running the payroll department during November and December?

3. **Cost Estimation using Regression Analysis:**

Milky Chocolates has observed the following overhead costs for the past 12 months:

Month Overhead Costs Boxes of Output

January . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . $11,400 4,500

February . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . ... 15,600 11,000

March . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 16,800 12,000

April . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 12,000 5,500

May . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 14,100 9,000

June . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 15,600 10,500

July . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .13,200 7,500

August . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 12,300 5,000

September . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .15,600 11,500

October . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .12,900 6,000

November . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .14,400 8,500

December . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 15,000 10,000

The results of the regression analysis are:

*TC* ­ = $8,781 + ($0.63 X Number of Boxes)

a. Plot the data and the regression line--see sample graph below:



b. Estimate total monthly costs for a month when 10,200 boxes of chocolate are

produced.