

## **Air Transportation Economics (210 pts)**

*Eventually Airlines* has plans to offer service between an Origin and a Destination for a specified time period (i.e. 6a.m. to 10a.am.). You are responsible for determining the airfare and type of aircraft used for this service.

Complete the table on the **following page** as follows;

1. **Column 2:** Calculate the Cumulative Demand for an Origin/Destination Pair for the following Average Airfares with the following properties: (20 pts)

- MS = 500
- AS = -0.005

$$\text{Cumulative Demand} = MS * e^{(\text{Avg Airfare} * AS)}$$

2. **Column 3:** Calculate the Total Revenue for each combination of Average Airfare and Cumulative Passenger Travel Demand (20 pts)

3. **Column 4:** Compute the Total Operational Cost to serve the Cumulative Passenger Demand (i.e. Seats) based on the equation (20 pts)

$$\text{Total Cost of Operation} = BH * \text{Seats} * (\text{NFCR} + (\text{FBR} * \text{FP}))$$

- Block Hours (Hours) = 5
- Seats = Cumulative Demand (assume LF = 1)
- Non-Fuel Cost Rate (\$/Seat per Hour)= 12
- Fuel Burn Rate (Gallons/Seat per Hour)= 9
- Fuel Price = \$1/Gallon

4. **Column 5:** Compute the Profit generated for each combination of Average Airfare (and associated Cumulative Passenger Demand), Revenue, and Total Cost. (40 pts)

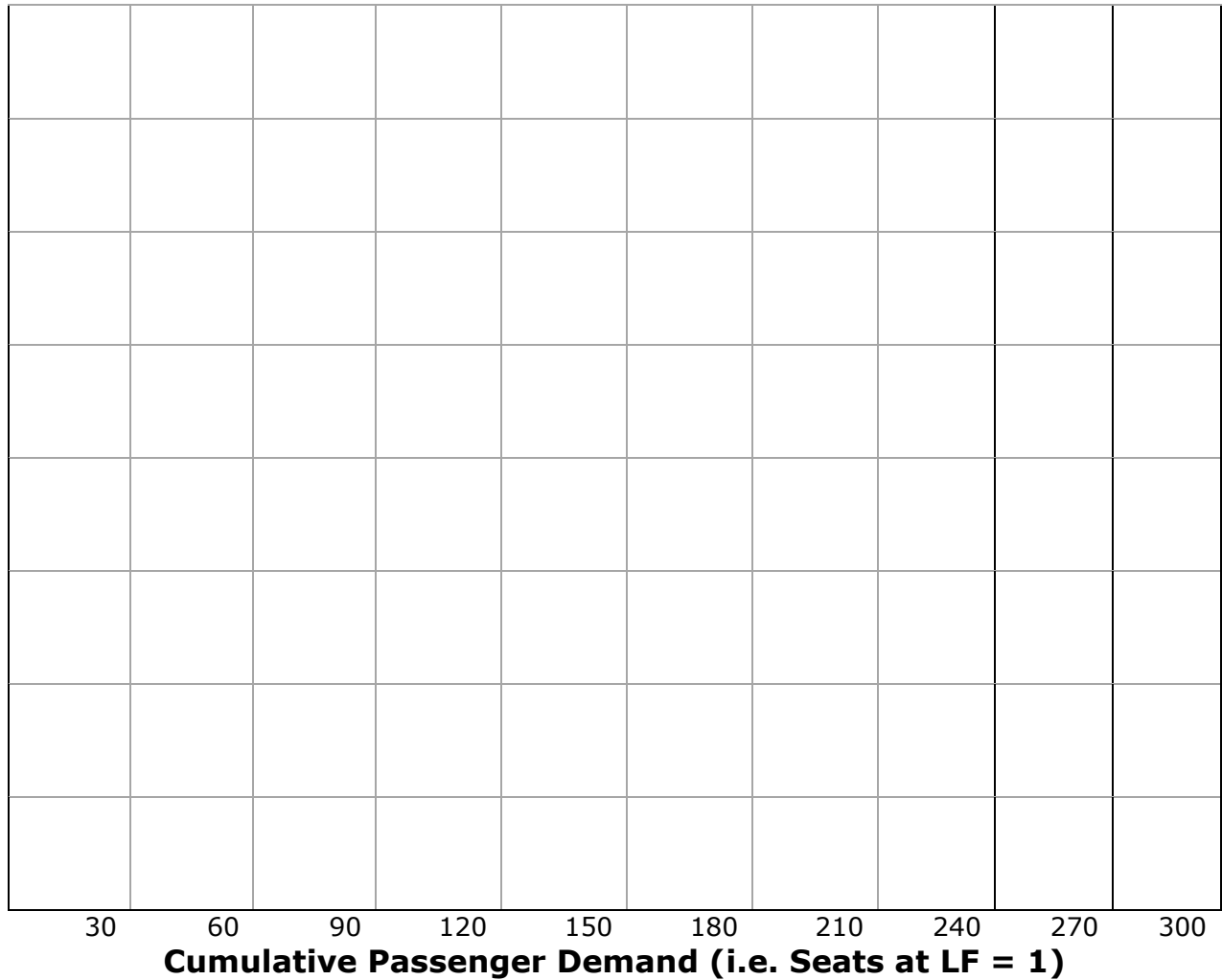
<b>Average Airfare</b>	<b>Cumulative Passenger Travel Demand</b>	<b>Total Revenue (\$)</b>	<b>Total Cost (\$)</b>	<b>Profit (\$)</b>
\$100	303	30,327	31,842.86	-1,516
\$150				
\$200				
\$250				
\$300				
\$350				
\$400				
\$450				
\$500	41	20,521	4,309.46	16,212

Plot Cumulative Passenger Demand (x-axis) vs Total Revenue, Total Costs, and Profit (y-axis)

Identify on the chart: (1) maximum revenue, (2) maximum profit, (3) zero profit, (4) theoretical maximum passengers

(20 pts)

**\$ (Revenue, Cost, Profit)**



5. Which airfare generates the **Maximum Total Revenue** and how many passengers are transported at this value? (5 pts)

\$ \_\_\_\_\_ Pax

6. Which airfare generates the **Maximum Profit** and how many passengers are transported at this value? (5 pts)

\$ \_\_\_\_\_ Pax

7. How much profit is gained when the economic operating point is shifted from the **Maximum Revenue point** to the **Maximum Profit point** and how many passengers are no longer transported? (5 pts)

\$ \_\_\_\_\_ Pax

8. If the Airfare is decreased by \$50 from the **Maximum Profit Point**, how much **Profit** is gained/lost and how many more/fewer passengers are transported? (show + or -) (5 pts)

\$ \_\_\_\_\_ Pax

9. If the Airfare is increased by \$50 from the **Maximum Profit Point**, how much **Profit** is gained/lost and how many more/fewer passengers are transported? (show + or -) (5 pts)

\$ \_\_\_\_\_ Pax

10. What is the impact of the airline's decision to maximize profit on the public's access to air service on this route? Are all the passengers that want to fly going to be served? Explain why/why not. (5 pts)

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Fuel price is increased from **\$1/gallon to \$3/Gallon**

Complete the table below

11. **Column 3:** Copy the results from previous table
12. **Column 4:** Compute the Total Operational Cost to serve the Cumulative Passenger Demand (i.e. Seats) based on the equation (20 pts)

$$\text{Total Cost of Operation} = \text{BH} * \text{Seats} * (\text{NFCR} + (\text{FBR} * \text{FP}))$$

- Block Hours (Hours) = 5
- Seats = Cumulative Demand (assume LF = 1)
- Non-Fuel Cost Rate (\$/Seat per Hour)= 12
- Fuel Burn Rate (Gallons/Seat per Hour)= 9
- Fuel Price = **\$3/Gallon**

13. **Column 5:** Compute the Profit generated for each combination of Average Airfare (and associated Cumulative Passenger Demand), Revenue, and Total Cost. (20 pts)

<b>Average Airfare</b>	<b>Cumulative Passenger Travel Demand</b>	<b>Total Revenue (\$)</b>	<b>Total Cost (\$)</b>	<b>Profit (\$)</b>
\$100	303	30,327	59,137	-28,810
\$150	236	35,427	46,056	-10,628
\$200	184	36,788		
\$250	143	35,813		
\$300	112	33,470		
\$350	87	30,410		
\$400	68	27,067		
\$450	53	23,715	10,276	13,438
\$500	41	20,521	8,003	12,518

14. Assuming the airlines operate at Maximum Profit, what is the impact of the increase in Fuel Prices from \$1/Gallon to \$3/Gallon on passenger access to air transportation service ? Explain why more/less passengers would be served. (5 pts)

Passengers Gained/Lost: \_\_\_\_\_

Explain:

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15. What is the impact of the increase in Fuel Prices from \$1/Gallon to \$3/Gallon on airline profitability? Explain why the airline is more/less profitable (5 pts)

Profit Gained/Lost: \_\_\_\_\_

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16. What is the impact of the increase in Fuel Prices from \$1/Gallon to \$3/Gallon on congestion at the departure or arrival airport? Explain why there would be more or less delays. TRICK QUESTION. THINK CAREFULLY. (5pts)

Congestion Increases/Decreases (CIRCLE ONE)

Explain:

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