

# Tupper High Fundraiser

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In[441]:= price = {55, 80, 95, 100, 120, 135, 155, 180};
sales = {140, 85, 45, 90, 115, 80, 65, 155};
list1 = Transpose[{price, sales}];
Price vs. Sales[Grid[Prepend[list1, {"Price", "Sales"}],
  Alignment → Center, Dividers → {1, 2, 3 → True, 2 → True}, Spacings → {2, 1}]]

In[445]:= selas = Reverse[sales];
selasadd = Accumulate[selas];
salesagain = Reverse[selasadd];
list2 = Transpose[{price, salesagain}];
Price vs. Expected Sales[Grid[Prepend[list2, {"Price", "Expected Sales"}],
  Alignment → Center, Dividers → {1, 2, 3 → True, 2 → True}, Spacings → {1, 1}]]
expectedsales = ListPlot[{{55, 775}, {80, 635}, {95, 550},
  {100, 505}, {120, 415}, {135, 300}, {155, 220}, {180, 155}}];
linearfit = Fit[{{55, 775}, {80, 635}, {95, 550}, {100, 505}, {120, 415},
  {135, 300}, {155, 220}, {180, 155}}, {1, x, x}, x];
Show[Plot[linearfit, {x, 50, 180}, PlotLabel → Style["Price vs. Expected Sales",
  FontSize → 18], AxesLabel → {Price, Expected Sales}], expectedsales]
linearfit

In[454]:= totalprofit = salesagain * price;
list3 = Transpose[{price, totalprofit}];
Price vs. Revenue[Grid[Prepend[list3, {"Price", "Revenue"}],
  Alignment → Center, Dividers → {1, 2, 3 → True, 2 → True}, Spacings → {1, 1}]]
salesvprofit = ListPlot[{{55, 42625}, {80, 50800}, {95, 52250}, {100, 50500},
  {120, 49800}, {135, 40500}, {155, 34100}, {180, 27900}}];
bestfit = Fit[{{55, 42625}, {80, 50800}, {95, 52250}, {100, 50500},
  {120, 49800}, {135, 40500}, {155, 34100}, {180, 27900}}, {1, x, x^2}, x];
Show[Plot[bestfit, {x, 50, 180}, PlotLabel → Style["Price vs. Revenue", FontSize → 18],
  AxesLabel → {Price, Revenue}], salesvprofit]
bestfit

In[72]:= FindMaximum[bestfit, {x, 95}]
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## Conclusion

The optimal price that Tupper High should charge is \$94.14 per season pass. According to the regression equation, this gives a profit of \$49,950.60. However, in a real life scenario, a more realistic number to charge could be \$94.00 or \$95.00 to make it a whole number. This is close to the optimal value while still providing a high amount of profit. In addition, this value is based on the regression equation. If based on the data table, the highest profit came from a cost of \$95.00, which provided an estimated profit of \$52,250. The best price to set the season pass would be \$95.00 because it has the highest profit directly according to the data, it is a round number, and it is close to the mathematical maximum profit value.