Given Values / Table

In[76]:=
```
xvals = {7, 16, 1, 8, 13, 6, 11, 14, 10, 3}
```

Out[76]= {7, 16, 1, 8, 13, 6, 11, 14, 10, 3}

In[77]:=
```
yvals = {8, 15, 5, 9, 22, 7, 8, 9, 6, 2}
```

Out[77]= {8, 15, 5, 9, 22, 7, 8, 9, 6, 2}

In[78]:=
```
list1 = Transpose[{xvals, yvals}]
```

Out[78]= {{7, 8}, {16, 15}, {1, 5}, {8, 9}, {13, 22}, {6, 7}, {11, 8}, {14, 9}, {10, 6}, {3, 2}}

In[79]:=
```
Text[Grid[Prepend[list1, {"x", "y"}], Alignment → Center]]
```

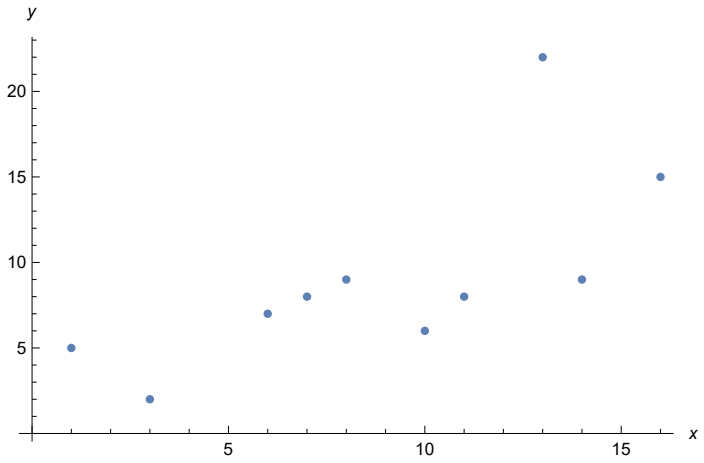
Out[79]=

x	y
7	8
16	15
1	5
8	9
13	22
6	7
11	8
14	9
10	6
3	2

Raw Data Graph

In[80]:=
```
Show[ListPlot[list1], AxesLabel → {x, y}]
```

Out[80]=



Line of Best Fit Calculations and Graph

In[81]:=
```
list1 = Sort[list1]
yValues = {}
xvals = Sort[xvals]
```

Out[81]= {{1, 5}, {3, 2}, {6, 7}, {7, 8}, {8, 9}, {10, 6}, {11, 8}, {13, 22}, {14, 9}, {16, 15}}

Out[82]= {}

Out[83]= {1, 3, 6, 7, 8, 10, 11, 13, 14, 16}

In[84]:=
```
{{1, 5}, {3, 2}, {6, 7}, {7, 8}, {8, 9}, {10, 6}, {11, 8}, {13, 22}, {14, 9}, {16, 15}}
```

Out[84]= {{1, 5}, {3, 2}, {6, 7}, {7, 8}, {8, 9}, {10, 6}, {11, 8}, {13, 22}, {14, 9}, {16, 15}}

In[85]:=
```
For[i = 1, i ≤ Length[list1], i++, AppendTo[yValues, list1[[i]][[2]]]]
```

In[86]:=
```
yValues
```

Out[86]= {5, 2, 7, 8, 9, 6, 8, 22, 9, 15}

In[87]:=
```
medpoint1x = Median[Take[xvals, {1, 3}]]
medpoint2x = Median[Take[xvals, {4, 7}]]
medpoint3x = Median[Take[xvals, {8, 10}]]
```

Out[87]= 3

Out[88]= 9

Out[89]= 14

In[90]:=
```
medpoint1y = Median[Take[yValues, {1, 3}]]
medpoint2y = Median[Take[yValues, {4, 7}]]
medpoint3y = Median[Take[yValues, {8, 10}]]
```

Out[90]= 5

Out[91]= 8

Out[92]= 15

In[93]:=
```
point1 = {medpoint1x, medpoint1y}
point2 = {medpoint2x, medpoint2y}
point3 = {medpoint3x, medpoint3y}
```

Out[93]= {3, 5}

Out[94]= {9, 8}

Out[95]= {14, 15}

In[96]:=
```
medpoints = {point1, point2, point3}
```

Out[96]= {{3, 5}, {9, 8}, {14, 15}}

In[97]:=
```
slope = (medpoint3y - medpoint1y) / (medpoint3x - medpoint1x)
```
Out[97]= $\frac{10}{11}$

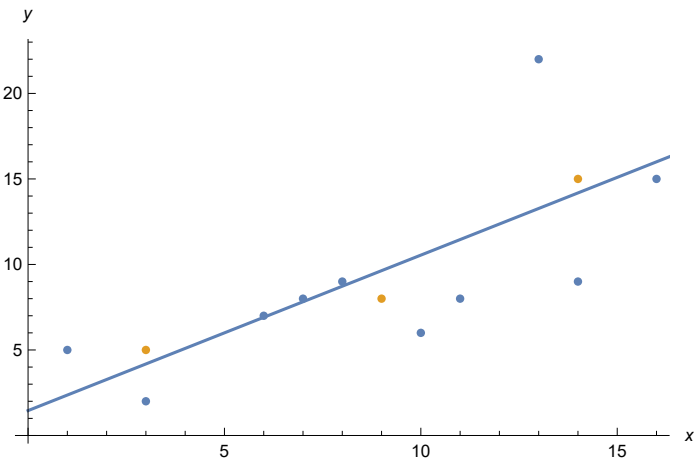
In[98]:=
```
point2yonline = slope (medpoint2x - medpoint1x) + medpoint1y
```
Out[98]= $\frac{115}{11}$

In[99]:=
```
difference = medpoint2y - point2yonline
```
Out[99]= $-\frac{27}{11}$

In[100]:=
```
newypoint2 = point2yonline + (difference / 3)
```
Out[100]= $\frac{106}{11}$

In[101]:=
```
medmedline[x_] := slope * (x - medpoint2x) + newypoint2
```

In[102]:=
```
Show[ListPlot[{list1, medpoints}], Plot[medmedline[x], {x, 0, 20}], AxesLabel → {x, y}]
```
Out[102]=



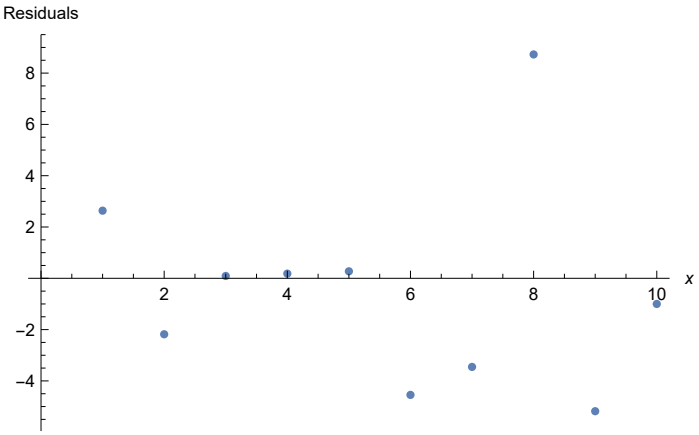
Calculating and Graphing Residuals

In[103]:=
```
lobfvalues = Table[medmedline[xvals[[i]]], {i, 1, 10}]
```
Out[103]= $\left\{\frac{26}{11}, \frac{46}{11}, \frac{76}{11}, \frac{86}{11}, \frac{96}{11}, \frac{116}{11}, \frac{126}{11}, \frac{146}{11}, \frac{156}{11}, 16\right\}$

In[104]:=
```
residuals = yValues - lobfvalues
```
Out[104]= $\left\{\frac{29}{11}, -\frac{24}{11}, \frac{1}{11}, \frac{2}{11}, \frac{3}{11}, -\frac{50}{11}, -\frac{38}{11}, \frac{96}{11}, -\frac{57}{11}, -1\right\}$

In[105]:=
```
Show[ListPlot[residuals], AxesLabel → {x, Residuals}]
```

Out[105]=



In[107]:=
```
sum = Total[residuals]
```

Out[107]= $-\frac{49}{11}$