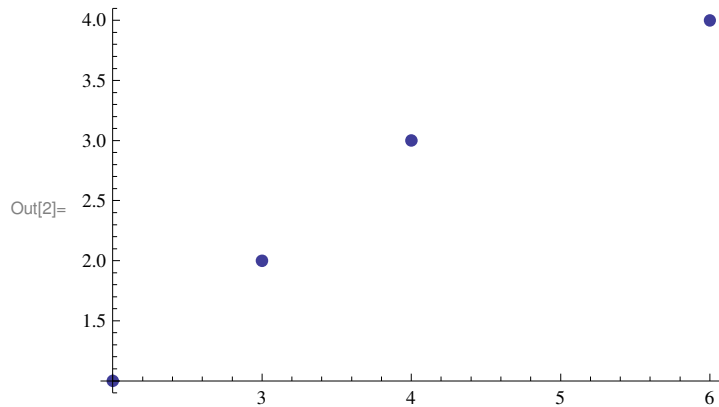


In[1]:= **T** = {{2, 1}, {3, 2}, {4, 3}, {6, 4}}

Out[1]= {{2, 1}, {3, 2}, {4, 3}, {6, 4}}

In[2]:= **q1** = ListPlot[T, PlotStyle -> PointSize[0.02]]



In[3]:= **X**[u\_, v\_] :=  $\sum_{k=1}^4 T[[k]][[1]]^u T[[k]][[2]]^v$

In[4]:= **A** = {{X[2, 0], X[1, 0]}, {X[1, 0], X[0, 0]}}

Out[4]= {{65, 15}, {15, 4}}

In[5]:= **A** // MatrixForm

Out[5]//MatrixForm=

$$\begin{pmatrix} 65 & 15 \\ 15 & 4 \end{pmatrix}$$

In[6]:= **B** = {{X[1, 1]}, {X[0, 1]}}

Out[6]= {{44}, {10}}

In[7]:= **B** // MatrixForm

Out[7]//MatrixForm=

$$\begin{pmatrix} 44 \\ 10 \end{pmatrix}$$

In[8]:= **Inverse**[A].B

Out[8]=  $\left\{ \left\{ \frac{26}{35} \right\}, \left\{ -\frac{2}{7} \right\} \right\}$

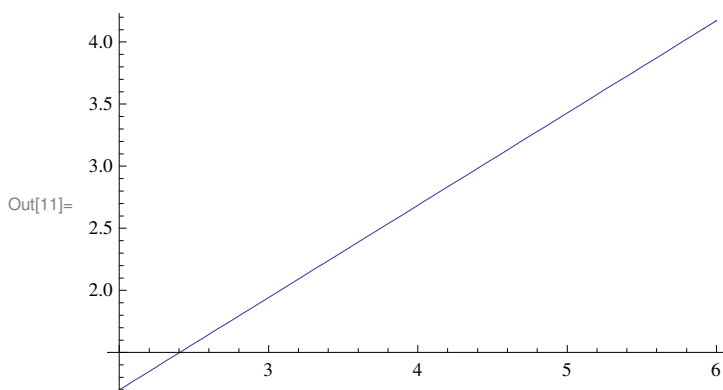
In[9]:= **N**[%]

Out[9]= {{0.742857}, {-0.285714}}

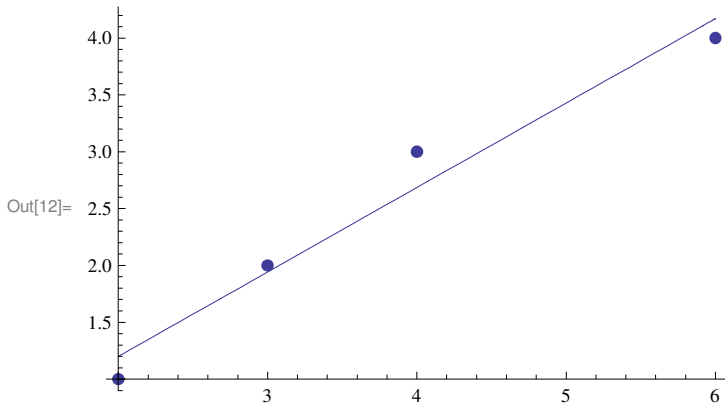
In[10]:= **p** = Fit[T, {1, x}, x]

Out[10]= -0.285714 + 0.742857 x

In[11]:= **q2** = Plot[p, {x, 2, 6}]



In[12]:= **Show[q1, q2]**



In[13]:= **A = {{X[4, 0], X[3, 0], X[2, 0]}, {X[3, 0], X[2, 0], X[1, 0]}, {X[2, 0], X[1, 0], X[0, 0]}}**

Out[13]= {{1649, 315, 65}, {315, 65, 15}, {65, 15, 4}}

In[14]:= **A // MatrixForm**

Out[14]/MatrixForm=

$$\begin{pmatrix} 1649 & 315 & 65 \\ 315 & 65 & 15 \\ 65 & 15 & 4 \end{pmatrix}$$

In[15]:= **B = {{X[2, 1]}, {X[1, 1]}, {X[0, 1]}}**

Out[15]= {{214}, {44}, {10}}

In[16]:= **B // MatrixForm**

Out[16]/MatrixForm=

$$\begin{pmatrix} 214 \\ 44 \\ 10 \end{pmatrix}$$

In[17]:= **Inverse[A].B**

Out[17]=  $\left\{ \left\{ -\frac{5}{44} \right\}, \left\{ \frac{367}{220} \right\}, \left\{ -\frac{21}{11} \right\} \right\}$

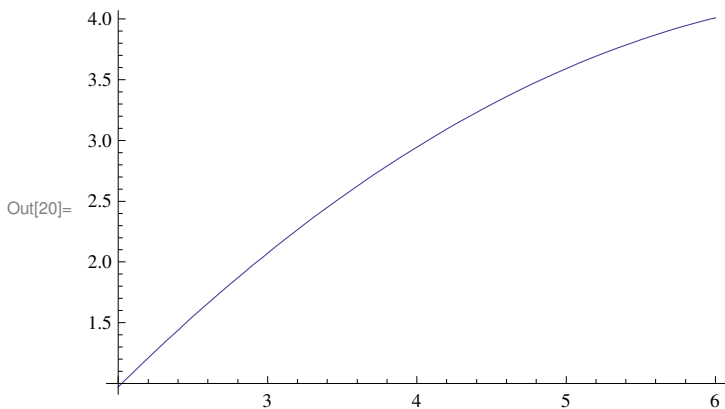
In[18]:= **N[%]**

Out[18]= {{-0.113636}, {1.66818}, {-1.90909}}

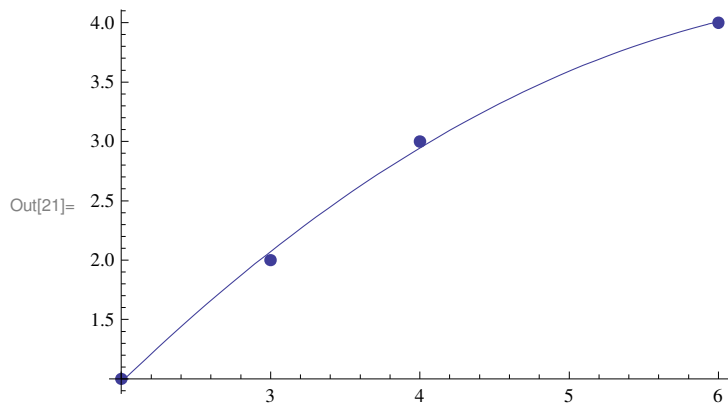
In[19]:= **pp = Fit[T, {x^2, x, 1}, x]**

Out[19]=  $-1.90909 + 1.66818 x - 0.113636 x^2$

In[20]:= **q3 = Plot[pp, {x, 2, 6}]**



In[21]:= **Show[q1, q3]**



In[22]:= **Fit[T, {x^3, x^2, x, 1}, x]**

Out[22]=  $-3.06422 \times 10^{-14} - 0.0833333 x + 0.375 x^2 - 0.0416667 x^3$

In[23]:= **InterpolatingPolynomial[T, x]**

Out[23]=  $1 + \left(1 + \frac{1}{24} (4 - x) (-3 + x)\right) (-2 + x)$

In[24]:= **Expand[%]**

Out[24]=  $-\frac{x}{12} + \frac{3x^2}{8} - \frac{x^3}{24}$

In[25]:= **N[%]**

Out[25]=  $-0.0833333 x + 0.375 x^2 - 0.0416667 x^3$

In[26]:= **Fit[T, {x^4, x^3, x^2, x, 1}, x]**

Out[26]=  $-0.456196 + 0.486912 x + 0.121558 x^2 + 0.00585375 x^3 - 0.00316803 x^4$