```
{qmath, rmath}=QRDecomposition[Ainit];

Text[Style["Matricea Q Mathematica",Bold,26]]

Style[MatrixForm[Simplify[Transpose[qmath]]],Bold,26]

Text[Style["Matricea R Mathematica",Bold,26]]

Style[MatrixForm[Simplify[rmath]],Bold,26]
```

Out[4120]=

Out[4124]= **!!!!!!!! Algoritmul Gram Schmidt !!!!!!!!!!!!**

Out[4128]=

Out[4132]= **!!!!!!!! Pasul 1 !!!!!!!!!!!!!!!!!!!**

Out[4136]=

Out[4188]= **Matricea A**

Out[4192]=
$$\begin{pmatrix} 45 & -187 & -33 \\ 60 & 84 & -169 \\ 100 & 190 & -40 \end{pmatrix}$$

Out[4208]= **Matricea Q**

Out[4212]=
$$\begin{pmatrix} \frac{9}{25} & 0 & 0 \\ \frac{12}{25} & 1 & 0 \\ \frac{4}{5} & 0 & 1 \end{pmatrix}$$

Out[4216]= **Matricea R**

Out[4220]=
$$\begin{pmatrix} 125 & r12 & r13 \\ 0 & r22 & r23 \\ 0 & 0 & r33 \end{pmatrix}$$

Out[4224]=

Out[4228]= **!!!!!!!! Pasul 2 !!!!!!!!!!!!!!!!!!**

Out[4232]=

Out[4252]= **Matricea Q**

Out[4256]=
$$\begin{pmatrix} \frac{9}{25} & -\frac{116}{125} & 0 \\ \frac{12}{25} & \frac{12}{125} & 0 \\ \frac{4}{5} & \frac{9}{25} & 1 \end{pmatrix}$$

Out[4260]= **Matricea R**

Out[4264]=
$$\begin{pmatrix} 125 & 125 & r13 \\ 0 & 250 & r23 \\ 0 & 0 & r33 \end{pmatrix}$$

Out[4268]=

Out[4272]= **!!!!!!!! Pasul 3 !!!!!!!!!!!!!!!!!!**

Out[4276]=

Out[4308]= **Matricea Q**

Out[4312]=
$$\begin{pmatrix} \frac{9}{25} & -\frac{116}{125} & \frac{12}{125} \\ \frac{12}{25} & \frac{12}{125} & -\frac{109}{125} \\ \frac{4}{5} & \frac{9}{25} & \frac{12}{25} \end{pmatrix}$$

Out[4316]= **Matricea R**

Out[4320]=
$$\begin{pmatrix} 125 & 125 & -125 \\ 0 & 250 & 0 \\ 0 & 0 & 125 \end{pmatrix}$$

Out[4324]= **Verificare QR = A**

Out[4328]= **Matricea QR**

Out[4332]=
$$\begin{pmatrix} 45. & -187. & -33. \\ 60. & 84. & -169. \\ 100. & 190. & -40. \end{pmatrix}$$

Out[4336]= **Matricea A initiala**

Out[4340]=
$$\begin{pmatrix} 45 & -187 & -33 \\ 60 & 84 & -169 \\ 100 & 190 & -40 \end{pmatrix}$$

Out[4344]= **Matricea Q**

Out[4348]=
$$\begin{pmatrix} 0.36 & -0.928 & 0.096 \\ 0.48 & 0.096 & -0.872 \\ 0.8 & 0.36 & 0.48 \end{pmatrix}$$

Out[4352]= **Matricea R**

Out[4356]=
$$\begin{pmatrix} 125. & 125. & -125. \\ 0. & 250. & 0. \\ 0. & 0. & 125. \end{pmatrix}$$

Out[4368]= **Matricea Q Mathematica**

Out[4372]=
$$\begin{pmatrix} \frac{9}{25} & -\frac{116}{125} & \frac{12}{125} \\ \frac{12}{25} & \frac{12}{125} & -\frac{109}{125} \\ \frac{4}{5} & \frac{9}{25} & \frac{12}{25} \end{pmatrix}$$

Out[4376]= **Matricea R Mathematica**

Out[4380]=
$$\begin{pmatrix} 125 & 125 & -125 \\ 0 & 250 & 0 \\ 0 & 0 & 125 \end{pmatrix}$$