Дано:

$$A = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 1 & 1 \\ 2 & 3 & 4 \end{pmatrix}$$

Найти:

rank A

Решение:

$$rank\ A = rank \begin{pmatrix} a_{1.} \\ a_{2.} \\ a_{3.} \end{pmatrix} = (1)$$

$$a_{1.} + a_{2.} = (1\ 2\ 3) + (1\ 1\ 1) = (1{+}1 \quad 2{+}1 \quad 3{+}1) =$$

$$= (2\ 3\ 4) = a_{3.}$$

$$(1) = rank \begin{pmatrix} a_{1.} \\ a_{2.} \\ a_{1.} + a_{2.} \end{pmatrix} = rank \begin{pmatrix} a_{1.} \\ a_{2.} \end{pmatrix} =$$

$$= rank \begin{pmatrix} a_{1.} \\ a_{2.} - a_{1.} \end{pmatrix} = (2)$$

$$a_{2.} - a_{1.} = (1\ 2\ 3) - (1\ 1\ 1) = (1{-}1 \quad 2{-}1 \quad 3{-}1) =$$

$$= (0\ 1\ 2)$$

$$(2) = rank \begin{pmatrix} 1 & 2 & 3 \\ 0 & 1 & 2 \end{pmatrix} = 2$$

Ответ:

rank A = 2