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# Selection Key

UNIVERSITY OF WYOMING

Math 2250—Fall 2023

Department of Mathematics

## Elementary Linear Algebra

### Quiz 1

Friday, September 1, 2023

Find all pairs of numbers  $(x, y)$  simultaneously satisfying the two linear equations

$$8x - 5y = 26 \quad \text{and} \quad 2x + 3y = 32.$$

Show your work, and check your answers.

$$\begin{bmatrix} 8 & -5 & | & 26 \\ 2 & 3 & | & 32 \end{bmatrix} \sim \begin{bmatrix} 2 & 3 & | & 32 \\ 8 & -5 & | & 26 \end{bmatrix} \sim \begin{bmatrix} 2 & 3 & | & 32 \\ 0 & -17 & | & -102 \end{bmatrix} \sim \begin{bmatrix} 2 & 3 & | & 32 \\ 0 & 1 & | & 6 \end{bmatrix}$$

interchange rows 1 and 2      Subtract 4 times row 1 from row 2      divide row 2 by -17

$$\sim \begin{bmatrix} 2 & 0 & | & 14 \\ 0 & 1 & | & 6 \end{bmatrix} \sim \begin{bmatrix} 1 & 0 & | & 7 \\ 0 & 1 & | & 6 \end{bmatrix}$$

subtract 3 times row 2 from row 1      divide row 1 by 2

The unique solution is  $(x, y) = (7, 6)$ .