INTERSECTIONS

(1) Plot the graphs of the three straight lines $y = x$, $y = 1.1x - 0.2$ and $y = 0.9x - 0.1$

What do the graphs tell you about the solutions to the two pairs of simultaneous equations:

    (1a) $y = x$

        $y = 1.1x - 0.2$

    and

    (1b) $y = x$

        $y = 0.9x - 0.1$

Explain why the solutions are different and yet the pairs of equations are nearly identical.

Considering the geometrical properties of the lines helps to explain why this happens.

(2) What do you notice about these two pairs of simultaneous equations:

    (2a) $x + 0.99999y = 2.99999$

          $0.99999x + y = 2.99998$

                and

    (2b) $x + 1.00001y = 2.99999$

          $0.99999x + y = 2.99998$.

Using a calculator, check that the solutions to (2a) are $x = 2$ and $y = 1$ and the solutions to (2b) are $x = -199\,998$ and $y = 199\,999$.

Consider the geometrical properties of the lines and explain why although the pairs of equations are nearly identical, the solutions are very different.

HELP

Study these two graphs and the pairs of simultaneous equations.

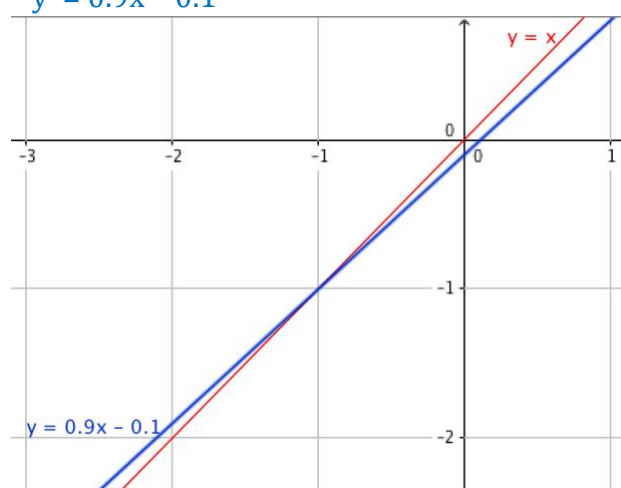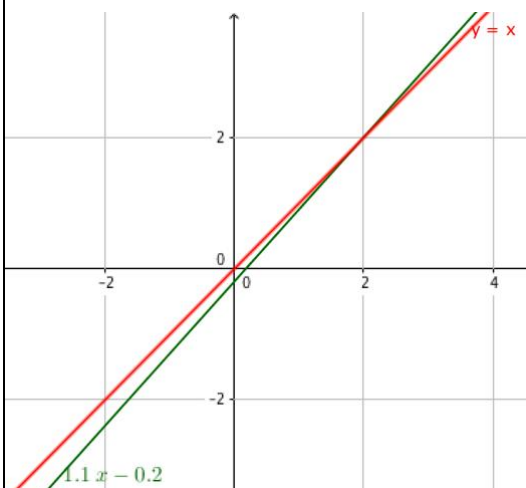What do you notice about these two graphs?

What do the graphs have to do with the equations?

What do the graphs tell you about the solutions of the two pairs of simultaneous equations?

$y = x$

$y = 1.1x - 0.2$ and $y = x$

                                          $y = 0.9x - 0.1$

NEXT

Make up your own similar example like the one given in the HELP section.

What do the graphs tell you about the solutions of the two pairs of simultaneous equations?