Completed Exercises from the lecture on

⟨ Systems of Two Linear Equations in Two Variables ⟩

1. Hard, Pages 2-7;

Can be found below.

Hard

(1) **d1b66ae6** SHORT ANSWER Case-Insensitive

$$-x + y = -3.5$$
$$x + 3y = 9.5$$

If (x, y) satisfies the system of equations above, what is the value of y?

1. Elimination.

$$-x + y = -3.5$$
$$(+) \quad x + 3y = 9.5$$

$$0 + 4y = 6 \quad \Rightarrow y = \frac{3}{2}$$

2. Substitution,

(1) $-x + y = -3.5 \Rightarrow y = -3.5 + x$

(2) $x + 3y = 9.5$

"(1) (2)" $x + 3(-3.5 + x) = 9.5 \quad \Rightarrow x = -5$

(3) **e1248a5c** [MULTIPLE CHOICE] [One answer only]

$$\frac{1}{2}x + \frac{1}{3}y = \frac{1}{6} \qquad \times 3$$
$$ax + y = c$$

In the system of equations below, a and c are constants. If the system of equations has an infinite number of solutions , what is the value of a?

a. $-\frac{1}{2}$
b. $\frac{1}{2}$
c. 0
d. $\frac{3}{2}$

$$\frac{1}{2}x + \frac{1}{3}y = \frac{1}{6} \qquad \times 3$$

$$\frac{3}{2}x + y = \frac{1}{2}$$

$$= ax + y = c$$

∪: $\qquad y = 2x + 3$

K: $\qquad (y = c(2x + 3)$, any constant c!

∪, K are giving the same info

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(4) **52cb8ea4** MULTIPLE CHOICE | One answer only

$$7x - 5y = 4$$
$$4x - 8y = 9$$

If (x, y) is the solution to the system of equations above, what is the value of $3x + 3y$?

a. 5
b. −5
c. −13
d. 13

$$7x - 5y = 4$$
$$\ominus \quad 4x - 8y = 9$$
$$\overline{3x + 3y = 4 - 9 = -5}$$

(6) **f718c9cf** SHORT ANSWER   Case-Insensitive

$$5x + 14y = 45$$
$$10x + 7y = 27$$

$10x + 7 \cdot 3 = 27$

$10x + 21 = 27$

The solution to the given system of equations is (x, y). What is the value of xy?

$10x = 6$

$x = \dfrac{3}{5} = 0.6$

$(-2) \quad 5x + 14y = 45$

$\searrow$

$-10x - 28y = -90$

$\oplus \quad 10x + 7y = 27$

___

$-21y = -63 \Rightarrow y = 3$

$x = 4.8$

Then $x \cdot y = 3 \cdot \dfrac{3}{5} = \dfrac{9}{5} = 1.8$

(7) **466b87e3**
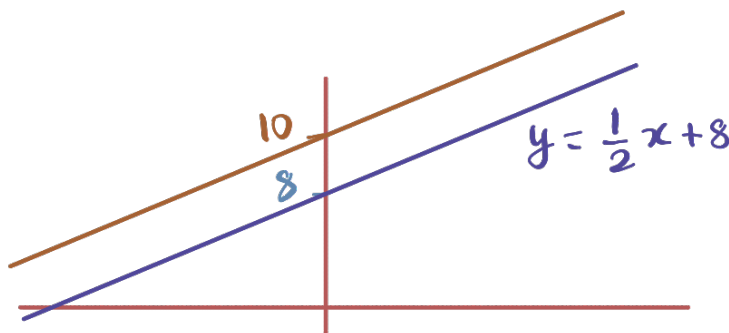
$$y = \frac{1}{2}x + 8$$

$$c = \frac{1}{2}$$

$$y = cx + 10$$

In the system of equations above, c is a constant. If the system has no solution, what is the value of c?

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$y = \frac{1}{2}x + 8$

(8) **e2e3942f** MULTIPLE CHOICE   One answer only

$$y = 2x + 1$$
$$y = ax - 8$$

In the system of equations above, a is a constant. If the system of equations has no solution, what is the value of a?

    a. 2
    b. 1
    c. 0
    d. $-\frac{1}{2}$

$a = 2$