A.A.10: Solving Linear Systems 2: Solve systems of two linear equations in two variables algebraically

1   What is the value of the *y*-coordinate of the solution to the system of equations $x + 2y = 9$ and $x - y = 3$?

2   What is the value of the *y*-coordinate of the solution to the system of equations $x - 2y = 1$ and $x + 4y = 7$?

3   If $a + 3b = 13$ and $a + b = 5$, the value of *b* is

4   If $x + y = -10$ and $x - y = 2$, what is the value of *x*?

5   What is the value of *y* in the following system of equations?
$$2x + 3y = 6$$
$$2x + y = -2$$

6   What is the value of the *y*-coordinate of the solution to the system of equations $2x + y = 8$ and $x - 3y = -3$?

7   What point is the intersection of the graphs of the lines $2x - y = 3$ and $x + y = 3$?

8   Which ordered pair satisfies the system of equations below?
$$3x - y = 8$$
$$x + y = 2$$

9   What is the solution of the system of equations $2x - 5y = 11$ and $-2x + 3y = -9$?

10   Which ordered pair is the solution of the following system of equations?
$$3x + 2y = 4$$
$$-2x + 2y = 24$$

11   What is the solution of the system of equations $c + 3d = 8$ and $c = 4d - 6$?

12   The equations $5x + 2y = 48$ and $3x + 2y = 32$ represent the money collected from school concert ticket sales during two class periods. If *x* represents the cost for each adult ticket and *y* represents the cost for each student ticket, what is the cost for each adult ticket?

13   Solve the following system of equations algebraically:
$$3x + 2y = 4$$
$$4x + 3y = 7$$
[Only an algebraic solution can receive full credit.]

14   When solved graphically, which system of equations will have exactly one point of intersection?
1) $y = -x - 20$
     $y = x + 17$
2) $y = 0.5x + 30$
     $y = 0.5x - 30$
3) $y = \frac{3}{5}x + 12$
     $y = 0.6x - 19$
4) $y = -x + 15$
     $y = -x + 25$

A.A.10: Solving Linear Systems 2: Solve systems of two linear equations in two variables algebraically
Answer Section

1 ANS:
2
$$x + 2y = 9$$
$$x - y = 3$$
$$3y = 6$$
$$y = 2$$

REF: 060925ia

2 ANS:
1
$$x - 2y = 1$$
$$x + 4y = 7$$
$$-6y = -6$$
$$y = 1$$

REF: 080920ia

3 ANS:
4
$$a + 3b = 13$$
$$a + b = 5$$
$$2b = 8$$
$$b = 4$$

REF: 080706a

4 ANS:
−4
$$x + y = -10$$
$$x - y = 2$$
$$2x = -8$$
$$x = -4$$

REF: 060824a

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5 ANS:
4

$2x + 3y = 6$

$2x + y = -2$

$2y = 8$

$y = 4$

REF: 080013a

6 ANS:
2

$2(x - 3y = -3)$

$2x + y = 8$

$2x - 6y = -6$

$7y = 14$

$y = 2$

REF: 081021ia

7 ANS:
$(2,1)$

$2x - y = 3.$ $x + y = 3$

$x + y = 3$ $2 + y = 3$

$3x = 6$ $y = 1$

$x = 2$

REF: 080429a

8 ANS:
$(2.5, -0.5)$

$3x - y = 8$

$x + y = 2$ $2.5 + y = 2$

$4x = 10$ $y = -0.5$

$x = 2.5$

REF: 060716a

9 ANS:
$(3, -1)$

$2x - 5y = 11$ $2x - 5(-1) = 11$

$-2x + 3y = -9$ $2x = 6$

$-2y = 2$ $x = 3$

$y = -1$

REF: 081109ia

10 ANS:

$(-4, 8)$

$3x + 2y = 4$. $\quad 3x + 2y = 4$

$-2x + 2y = 24 \quad 3(-4) + 2y = 4$

$\quad\quad 5x = -20 \quad -12 + 2y = 4$

$\quad\quad\quad x = -4 \quad\quad\quad y = 8$

REF: 060007a

11 ANS:

$c = 2, d = 2$

$\quad c + 3d = 8 \quad c = 4d - 6$

$4d - 6 + 3d = 8 \quad c = 4(2) - 6$

$\quad\quad 7d = 14 \quad c = 2$

$\quad\quad\quad d = 2$

REF: 061012ia

12 ANS:

$8

$5x + 2y = 48$

$3x + 2y = 32$

$\quad 2x = 16$

$\quad x = 8$

REF: fall0708ia

13 ANS:

$(-2, 5)$. $3x + 2y = 4 \quad 12x + 8y = 16$. $\quad 3x + 2y = 4$

$\quad\quad 4x + 3y = 7 \quad 12x + 9y = 21 \quad 3x + 2(5) = 4$

$\quad\quad\quad\quad y = 5 \quad\quad\quad 3x = -6$

$\quad\quad\quad\quad\quad x = -2$

REF: 010937ia

14 ANS: 1

In (2) – (4), the equations in each system have equal slope, and therefore do not intersect.

REF: 080529a