Review: Systems of Equations

Solutions Guide

2) $-6x - 4y = 20$

$y = 2x + 2$

$-6x - 4(2x+2) = 20$

$-6x - 8x - 8 = 20$

$-14x = 28$

$\boxed{x = -2}$ ← "geometry answer"

$y = 2x + 2$

$y = 2(-2) + 2$

$y = -4 + 2$

$\boxed{y = -2}$

$\boxed{(-2, -2)}$ ← "algebra answer"

4)

$y = 5x - 7$

$2x + 2y = -14$

$2x + 2(5x - 7) = -14$

$2x + 10x - 14 = -14$

$12x = 0$

$\boxed{x = 0}$ ← still valid, algebraically!

$y = 5x - 7$

$y = 5(0) - 7$

$y = 0 - 7$

$\boxed{y = -7}$

6) $6x + y = -12$

$-18x - 3y = 36$

$3(6x + y) = 3(-12)$

$18x + 3y = -36$

$-18x - 3y = 36$

$0 = 0$ ← this is true, so we say "all real numbers" as the solution or "x is a real #"

8) $2x + y = 7$
$-x + 5y = 2$

a) $2(-x + 5y) = 2(2)$

$-2x + 10y = 4$

b) $2x + y = 7$

$11y = 11$

$\boxed{y = 1}$

c) $-x + 5y = 2$

$-x + 5(1) = 2$

$-x + 5 = 2$

$-x = -3$

$\boxed{x = 3}$

10) $8x + 3y = 5$
$-8x - 3y = 3$

notice

$0 + 0 = 8$

$0 = 8$

this is false, so there is "no solution"
it is algebraically valid, but should not occur in geometry applications.

12) $5x - 5y = -10$
$2x + 6y = 12$

$-2(5x - 5y) = -2(-10)$

$5(2x + 6y) = 5(12)$

12
×5
60

$-10x + 10y = 20$
$10x + 30y = 60$

$40y = 80$

$\boxed{y = 2}$

$2x + 6y = 12$

$2x + 6(2) = 12$

$2x + 12 = 12$

$2x = 0$

$\boxed{x = 0}$

14) $0 = 4x - 16 + 8y$

$4x + 14 = -2y$

a) line them up nicely

$-4x - 8y = -16$

$4x + 2y = -14$

b) proceed as usual.

$-6y = -30$

$\boxed{y = 5}$

$4x + 14 = -2y$

$4x + 14 = -2(5)$

$4x + 14 = -10$

$4x = -24$

$\boxed{x = -6}$

16) $13 - 5y = -8x$

$3x = 5y + 17$

a) line them up nicely

$8x - 5y = -13$

$3x - 5y = 17$

b) multiply 2nd by -1

$8x - 5y = -13$

$-3x + 5y = -17$

c) proceed

$5x = -30$

$\boxed{x = -6}$

-18

-17

-35

$3x = 5y + 17$

$3(-6) = 5y + 17$

$-18 = 5y + 17$

$-35 = 5y$

$-7 = y$

$\boxed{y = -7}$

18) $-10 + 2y = 8x$

$4y = 20 - 3x$

a) line them up nicely (remember to change the signs!)

$-8x + 2y = 10$

$3x + 4y = 20$

b) multiply 1st by -2

$-2(-8x + 2y) = -2(10)$

$16x - 4y = -20$

$3x + 4y = 20$

c) proceed

$19x = 0$

$\boxed{x = 0}$

$4y = 20 - 3x$

$4y = 20 - 3(0)$

$4y = 20 - 0$

$4y = 20$

$\boxed{y = 5}$