Algebra 1

Practice 8.2 Systems of Equations (Substitution)

Solve each system by substitution.

1) $4x - 4y = -4$
$y = -4x + 1$

(0, 1)

$4x - 4(-4x+1) = -4$
$4x + 16x - 4 = -4$
$20x - 4 = -4$
$20x = 0$
$x = 0$

$y = -4x + 1$
$y = -4(0) + 1$
$y = 1$

(0, 1)

2) $y = 2x - 7$
$2x - 4y = 10$

(3, –1)

$2x - 4(2x-7) = 10$
$2x - 8x + 28 = 10$
$-6x + 28 = 10$
$-28 \quad -28$
$-6x = -18$
$x = 3$

$y = 2x - 7$
$y = 2(3) - 7$
$y = -1$

(3, –1)

3) $8x + 5y = -24$
$y = 5x + 15$

(–3, 0)

$8x + 5y = -24$
$8x + 5(5x+15) = -24$
$8x + 25x + 75 = -24$
$33x + 75 = -24$
$-75 \quad -75$
$33x = -99$
$x = -3$

$y = 5x + 15$
$y = 5(-3) + 15$
$y = 0$

(–3, 0)

4) $y = -4x - 5$
$6x - 5y = -1$

(–1, –1)

$6x - 5y = -1$
$6x - 5(-4x-5) = -1$
$6x + 20x + 25 = -1$
$26x + 25 = -1$
$26x = -26$
$x = -1$

$y = -4x - 5$
$y = -4(-1) - 5$
$y = 4 - 5$
$y = -1$

(–1, –1)

5) $y = 4x - 24$
$-3x - 5y = -18$

(6, 0)

$-3x - 5y = -18$
$-3x - 5(4x-24) = -18$
$-3x - 20x + 120 = -18$
$-23x + 120 = -18$
$-23x = -138$
$x = 6$

$y = 4x - 24$
$y = 4(6) - 24$
$y = 0$

(6, 0)

6) $y = 4x - 17$
$4x + 4y = 12$

(4, –1)

$4x + 4y = 12$
$4x + 4(4x-17) = 12$
$4x + 16x - 68 = 12$
$20x - 68 = 12$
$+68 \quad +68$
$20x = 80$
$x = 4$

$y = 4x - 17$
$y = 4(4) - 17$
$y = -1$

(4, –1)

7) $x = -1 - 3y$
$2x - 4y = -22$

(–7, 2)

$2(-1-3y)-4y=-22$
$-2-6y-4y=-22$
$-2-10y=-22$
$-10y=-20$
$y=2$

$x=-1-3y$
$x=-1-3(2)$
$x=-7$

(-7, 2)

8) $-x + 3y = 4$
$x = 4y - 3$

(–7, –1)

$-(4y-3)+3y=4$
$-4y+3+3y=4$
$-y+3=4$
$-y=1$
$y=-1$

$x=4y-3$
$x=4(-1)-3$
$x=-7$

(-7, -1)

Solve for y!

9) $4x + y = -3$
$-7x - 3y = 9$

(0, –3)

$y=-3-4x$

$-7x-3(-3-4x)=9$
$-7x+9+12x=9$
$5x+9=9$
$5x=0$
$x=0$

$y=-3-4x$
$y=-3-4(0)$
$y=-3$
(0, -3)

10) $x = 5y - 11$
$-9x - 7y = -5$

(–1, 2)

$-9(5y-11)-7y=-5$
$-45y+99-7y=-5$
$-52y+99=-5$
$-52y=-104$
$y=2$

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

(-1, 2)

11) Is the point (-1, 3) a solution of the system of linear equations below?

$x + y = 2$
$y - x = 2$

No

$-1+3=2$ (yes)
$2=2$ ✓

$3-(-1)=2$
$4=2$ X

NO!

12) Is the point (1, 7) a solution of the system of linear equations below?

$2x - 4 = 5$
$x = 1$

No

$2(1)-4=5$
$2-4=5$
$-2=5$ X

NO!

Must work in both!