HW review p. 239 #26

$$\boxed{\frac{1}{2}x + \frac{1}{4}y = 5}$$

$$\boxed{x - \frac{1}{2}y = 1}$$

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

$$x = \frac{1}{2}(9) + 1$$

$$x = \frac{9}{2} + 1$$

$$= \frac{11}{2}$$

$$\frac{1}{2}\left(\frac{1}{2}y + 1\right) + \frac{1}{4}y = 5$$

$$\frac{1}{4}y + \frac{1}{2} + \frac{1}{4}y = 5$$

$$2 \cdot \frac{1}{2}y = \frac{9}{2} \cdot 2$$

$$y = 9$$

$$\left(\frac{11}{2}, 9\right)$$

(18) $4x - y = 17$ $-9x + 8y = 2$

$(6, 7)$ $24 - 7 = 17 \checkmark$ $-54 + 56 = 2 \checkmark$

~~$(7, 6)$~~ $28 - 6 = 22 \neq 17 \times$

~~$(7, 11)$~~ $28 - 11 = 17 \checkmark$ $-63 + 88 = 2 \times$

~~$(11, 7)$~~ $44 - 7 = 17 \times$

2

(31) $2.50 = bag of popcorn X

$2 = pretzel y

$336 = sales

b = bags of pop.

$\frac{1}{2}b$ = # of pretzels

$$2.50x + 2y = 336$$

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

$$2.50x + 2y = 336$$

$$2.50x + 2\left(\tfrac{1}{2}x\right) = 336$$

$$2.5x + x = 336$$

$$3.5x = 336$$

$$x = 96$$

$$\tfrac{1}{2}x = y$$

$$\tfrac{1}{2}(96) = y$$

$$y = 48$$

96 pop.
48 pret.

Solving linear systems:

    — Graphing & estimating intersection (not too accurate)

    — Substitution (accurate, but lots of work)

    — By adding / subtracting
        — easier than substitution
          (but you can't always use it!)

Adding/Subtracting to solve linear systems:

$$x + 5 = 7$$
$$+2 = +2$$
$$-4 = -4$$
$$+2-4 = +2-4$$
$$+x = +x$$
$$+\frac{2}{3}x = +\frac{2}{3}x$$
$$+y = +y$$
$$+\frac{1}{2}y = +\frac{1}{2}y$$
$$+\frac{1}{2}y + \frac{2}{3}x = +\frac{1}{2}y + \frac{2}{3}x$$

$$x + 5 = 7$$

$$+ a = + b \quad \text{if} \quad a = b$$

$$+ z = + 2 \quad \text{if} \quad z = 2$$

$$+ y = 3x + 7 \quad \text{if} \quad y = 3x + 7$$

you can add expressions that look different __if__ those two expressions are equal to each other

$$x + 5 = 11$$
$$y + 2 = 9$$
$$\overline{}$$
$$x + y + 7 = 20$$

$$x + 2y = 6$$
$$2x + 3y = 15$$
$$\overline{}$$
$$3x + 5y = 21$$

$$x + 3y = 7$$
$$-2x - y = 4$$
$$\overline{}$$
$$-x + 2y = 11$$

$$-y = 2x + 4$$
$$\Leftarrow \quad -2x - y = 4$$

$$7x + 2y = 4$$
$$-5x + 6y = 10$$

$$2x + 8y = 14$$

$$4y = 2x + 3$$
$$5y = x + 6$$
$$-y = 3x + 9$$

$$4y = 2x + 3$$
$$-x = 5y + 6$$

$$+x - 5y \quad -5y + x$$
$$-y = 3x + 9$$

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

$$-x - 5y = 6$$
$$+x \qquad +x$$

$$-5y = 6 + x$$

$$2x + 3y = 7$$
$$3x - 3y = 3$$

$$5x + 0y = 10$$

$$\frac{5x}{5} = \frac{10}{5}$$

$$\boxed{x = 2}$$

$(2,1)$

$2(2) + 3y = 7$

$4 + 3y = 7$

$3y = 3$

$\boxed{y = 1}$

Rewrite the linear system so that the like terms are arranged in columns.

1. $8x - y = 19$

~~$y + 3x = 7$~~

$+\ 3x + y = 7$
_____
$11x + 0y = 26$
$11x = 26$
⋮
•

2. $4x = y - 11$

~~$6y + 4x = -3$~~

$-6y \qquad -6y$

$-(\ 4x) = (+6y + 3)$
_____
$0x = 7y - 8$
$0 = 7y - 8$
⋮
•

3. $9x - 2y = 5$

~~$2y = 11x + 8$~~

$+11x \qquad +11x$

$+\ 11x + 2y = 8$
_____
$20x + 0y = 13$
$20x = 13$
⋮
•

Solve the linear system by using elimination.

10. $x + 5y = 28$

$+$ $-x - 2y = -13$

$3y = 15$

$y = 5$

$x = 3$ $(3, 5)$

$x + 5(5) = 28$
$x + 25 = 28$
$x = 3$

11. $7x - 4y = -30$

$3x + 4y = 10$

12. $6x + y = 39$

$+$ $+2x + y = +17$

$8x = 56$

$x = 7$

$y = -3$

$(7, -3)$

$6(7) + y = 39$
$42 + y = 39$
$y = -3$

13. $3x = y - 20$

$-7x - y = 40$

14. $2x - 6y = -10$

$4x = 10 + 6y$

$+$ $^-4x + 6y = ^-10$

$-2x = ^-20$

$x = 10$

$y = 5$

$4(10) = 10 + 6y$
$40 = 10 + 6y$
$30 = 6y$
$y = 5$

$(10, 5)$

15. $x - 3y = 6$

$-2x = 3y + 33$

Quiz tomorrow:
  7.1, 7.2, 7.3 solving linear systems

    — graphing
    — substitution
    — elimination (adding/subtracting)
Homework:
    P. 447: 3 - 30 (every 3rd), 40