Algebra 2

Ch. 3   Handout 3.2

Solving systems Algebraically

Not every system can be solved easily bygraphing. Although you can graph eachline easily, the exact point of intersection is not obvious.

Substitution and **Elimination method** allows you to find exact solution

Use the elimination method to solve each system.

Check

4) $3x + y = -9$

$+$ $\underline{-3x - 2y = 12}$

$3(-2) + -3 = -9$

$-3(-2) - 2(-3) = 12$

$-y = 3$

$y = -3$

$3x + y = -9$

$3x + -3 = -9$

$3x = -6$

$x = -2$

$\boxed{\begin{array}{l} x = -2 \\ y = -3 \end{array}}$

Use the elimination method to solve each system.

3) $(-3x + 5y = 6)$
$6x - 10y = 0$

$- 6x + 10y = 12$
$+ 6x - 10y = 0$

$0 \neq 12$

No Solution

Use the elimination method to solve each system.

2) $(-3x + 5y = 6)$
$6x - 10y = -12$

$$-6x + 10y = 12$$
$$+\ 6x - 10y = -12$$
$$0 = 0$$

Infinitely Many Solutions

Use the elimination method to solve each system.

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

7) $2x = -4y - 4$ $3(4) + 5(-3) = -3$

$3x + 5y = -3$

$x = 4$
$y = -3$

$3(2x + 4y = -4)$
$-2(3x + 5y = -3)$

$6x + 12y = -12$
$+\ -6x - 10y = 6$

$2y = -6$
$y = -3$

$3x + 5(y) = -3$
$3x + 5(-3) = -3$
$3x + -15 = -3$
$3x = 12$
$x = 4$

8. With a tail wind, a helicopter traveled 300 miles in 1 hour and 40 minutes. The return trip against the same wind took 20 minutes longer. Find the wind speed and also the air speed of the helicopter.

$\frac{140}{60} = 1\frac{3}{3} = \frac{5}{3}$

air speed of helicopter = x = 165 mph

windspeed = y   = 15 mph

	R	×	t	=	D
tailwind	x+y		5/3		$\frac{5}{3}(x+y)$
headwind	x-y		2		$2(x-y)$

$\frac{3}{5} \cdot \frac{5}{3}(x+y) = 300 \cdot \frac{3}{5}$ (60)

$\frac{1}{2} \cdot 2(x-y) = 300 \cdot \frac{1}{2}$ (150)

$$x+y = 180 \longrightarrow x+y = 180$$
$$x-y = 150 \qquad\qquad 165+y = 180$$
$$\overline{}$$
$$2x = 330 \qquad\qquad y = 15$$
$$x = 165$$

Equivalent systems: are systems that have the same solutions.

Review -- Elimination Method

1. Rewrite system to align like terms

2. Eliminate one of the variables

3. Solve for other variable

4. Plug it back in to the original equation

Assignment:

Pgs 128-129 18-40 evens, 44-52 evens