Honors Advanced Algebra
Target 7A: Walk Around

Questions are on page 2 and 3

DATE: _____

Directions: Complete each problem and show your work. Check your answers.

1) $3x+5 = y+4x$, $-4x \quad -4x$

$-x+5 = y$

$\begin{cases} y = -x+5 \\ y = x^2 \end{cases}$ —OR— Solve algebraically

Graph to find solutions

How do you finish?

$y = x^2$

$x^2 = -x+5$

$x^2+x-5=0$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$= \frac{-1 \pm \sqrt{1^2-4(1)(-5)}}{2(1)}$

$= \frac{-1 \pm \sqrt{21}}{2}$ $\therefore x = \frac{-1+\sqrt{21}}{2}$ or $x = \frac{-1-\sqrt{21}}{2}$

2) $\begin{cases} y = |x+3| \\ 15x+20y=0 \end{cases} \Rightarrow \begin{cases} y = |x+3| \\ y = -\frac{3}{4}x \end{cases}$ Graph it! —OR—

$15x+20y=0$

$\frac{20y}{20} = \frac{-15x}{20}$

$y = -\frac{3}{4}x$

Algebraically, we have:

$-\frac{3}{4}x = |x+3| \Rightarrow -\frac{3}{4}x = x+3$ or $-\frac{3}{4}x = -(x+3)$

How do you finish?

$-3x = 4x+12$

$-7x = 12$

$x = \frac{12}{-7}$

$-\frac{3}{4}x = -x-3$

$-3x = -4x-12$

$x = -12$

3) $\begin{cases} y = \log_{10} x \\ y = 3x \end{cases}$ → common log

No intersection since $y = 3x$ goes through origin and $y = \log x$ doesn't. You can see this visually by graphing.

∴ No solution

4) $\begin{cases} y = 17x+1 \\ y = -24x+68 \end{cases}$

$17x+y = -24x+68$

$24x \quad -1 = +24x \quad -1$

$\frac{41x}{41} = \frac{-67}{41}$

$x = 67/41$

$y = 17x+1$

$= 17(67/41)+1$

$= \frac{1139}{41} + 1$

$= \frac{1139}{41} + \frac{41}{41}$

$= \frac{1180}{41}$ ∴ $\left(\frac{67}{41}, \frac{1180}{41}\right)$

5) $\begin{cases} y = -x+8 \\ y = -2x+16 \end{cases}$ ∴ (8,0) (You can graph it, too)

$-x+8 = -2x+16$

$+2x \quad +2x \quad -8$

$x = 8$

I would tell him that mathematically speaking the solution to the system is (8,0) and the meaning of it depends on context.

6) $\begin{cases} y = -x+2 \\ y = x+2 \end{cases}$

$-x+2 = x+2$

$+x \quad = \quad +x$

$2 = 2x+2$

$-2 \quad = \quad -2$

$0 = 2x \Rightarrow x = 0$

∴ (0,0), A.

(You can graph it, too)

7) D!

8) D!

9) B!

10) C!

1. At which point do the two equations $3x + 5 = y + 4x$ and $y = x^2$ intersect?

2. At which point do the equations $y = |x + 3|$ and $15x + 20y = 0$ intersect?

3. Find the intersection point of $y = \log x$ and $y = 3x$.

4. Find the intersection of the two equations $y = 17x + 1$ and $y = -24x + 68$.

5. Imagine you're interviewing for a position with Shmoop (your dream job, obviously) and you don't want to screw it up. Dave, the interviewer, asks you to find the intersection of the equations $y = -x + 8$ and $y = -2x + 16$. What do you tell him?

6. Which of the following points is on both line $y = -x + 2$ and line $y = x + 2$?
   (A) (0, 0)

   (B) (0, 1)

   (C) (0, -1)

   (D) (0, 2)

7. When estimating the intersection of two lines on a graph, you can get a precise answer. Is this statement true or false?

   (A) True, since graphs are always exactly correct when it looks as if the line is specifically at one point

   (B) False, because one can never be completely sure if the graph is correct since it depends highly on the sensitivity of the graph

   (C) False, since graphs offer limited visibility and it's usually impossible to see the entire function

   (D) Both (B) and (C)

8. Your classmate needs to find the points of intersection of two very simple equations. She makes a table that lists 5 or so integers and finds a point of intersection. She thinks she's done and goes to play outside. What do you think of this?

   (A) She's definitely done. She should go have fun!

   (B) A table of values may not show the full story because there may be points of intersection missed, but they're easy equations so she's probably done.

   (C) She isn't finished until she's graphed the two functions and visually seen their intersection point.

   (D) There's no way she's finished. She has to calculate it mathematically only.

9. When you find a point on a graph that you think is the intersection, the best way to double check your answer is to:

   (A) Plug in the x value to see if one of the y values of one of the equations matches the one you approximated from the graph

   (B) Plug in the x value to see if both of the y values of both of the equations match the one you approximated from the graph

   (C) Plug in the y values to see if one of the x values of one of the equations matches the one you approximated from the graph

   (D) None of the above

10. The most accurate way of finding the points of intersection of a system of equations is via:

    (A) A table of values

    (B) A graph

    (C) Using algebra to solve for the variables

    (D) None of the above