SYSTEM of INEQUALITIES: WORD PROBLEMS

*****Key words******

- "at least": greater than or equal to (≥)
- "no more than"/ "at most": less than or equal to (≤)
- "more than": greater than (>)
- "less than": less than (<)

For each of the following: Write a system of linear inequalities to model e
DO NOT SOLVE BY GRAPHING.

1. Bob has at least $5,000 in savings. His savings balance is more than 3 times g checking balance.

Step 1 - Define variables

x - Saving account $

y - checking " $

Step 2 - Create Inequalities

1) $x \geq \$5000$

2) $x > 3y$

2. Jonah is going to the store to buy candles. Small candles cost $3.50 and large c $5.00. He needs to buy at least 20 candles, and he can spend no more than $80.

x - small candles

y - large candles

(1) $x + y \geq 20$

(2) $\$3.50x + \$5.00y \leq \$80$

3. John is doing a fundraiser for school. He needs to sell at least $200 worth of item $10 each and hats cost $8 each. He must sell more than 12 hats.

x - shirts

y - hats

(1) $\$10x + \$8y \geq \$200$

(2) $y > 12$

Name _____ **Date**_____ **Per**_____

Inequality Assignment: For each of the following: Write a system of linear inequalities to model each situation. DO NOT SOLVE

1. Bill is doing a fundraiser for soccer. He needs to sell at least $100 worth of items. Candy bars cost $2 each and shirts cost $10 each. He must sell more than 4 candy bars.

X - candy bars
Y - shirts

① $\$2x + \$10y \geq 100$
② $x > 4$

2. Annie has at least $9,000 in savings. Her savings balance is more than 2 times greater than her checking balance.

X - savings
Y - checking

① $x \geq \$9000$
② $x > 2y$

3. Sam is going to the store to buy pumpkins. Small pumpkins cost $2.50 and large pumpkins cost $6.00. He needs to buy at least 20 pumpkins, and he can spend no more than $90.

X - small pumpkins
Y - large "

① $x + y \geq 20$
② $\$2.50x + \$6.00y \leq \$90$

x int
$5x - (0) = -3$
$\frac{5}{5}x = \frac{-3}{5}$
$x = \frac{-3}{5}$
$(-.06, 0)$

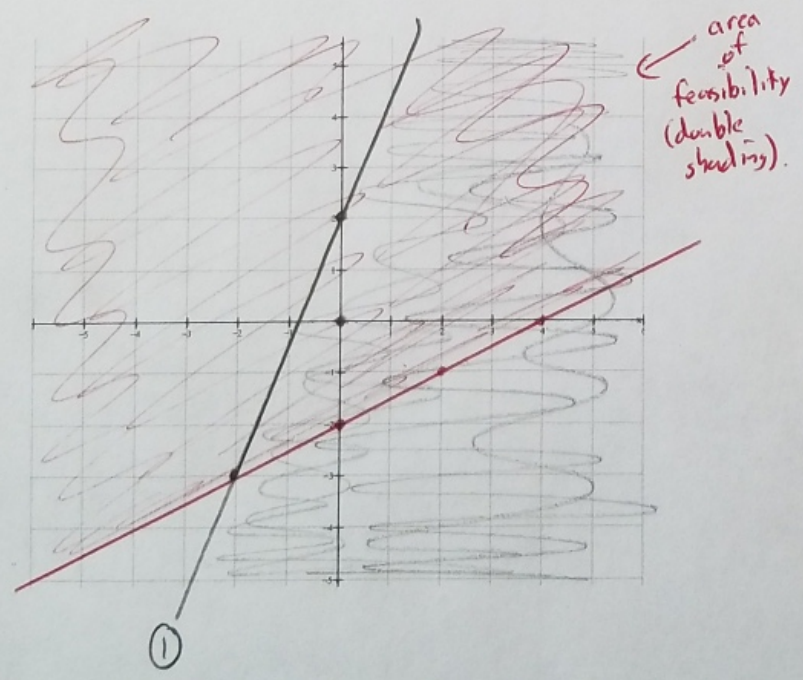
y int
$5(0) - y = -3$
$-y = -3$
$y = 3$
$(0, 3)$

Review: Graph the solution set to the system of inequalities on the axes below.

4. $\begin{cases} ① \ y \leq \frac{5}{2}x + 2 \\ ② \ y \geq \frac{1}{2}x - 2 \end{cases}$

① Test (0,0)
$0 \leq 0 + 2$
$0 \leq 2$ ✓

② (0,0)
$0 \geq 0 - 2$
$0 \geq -2$ ✓



5. $\begin{cases} ① \ x + y < -3 \\ ② \ 5x - y \leq -3 \end{cases}$

(could also use $y = mx + b$!)

① x int
$x + (0) = -3$
$x = -3$
$(-3, 0)$

y int
$(0) + y = -3$
$y = -3$
$(0, -3)$

(0,0) Test
$0 + 0 < -3$
$0 < -3$ ✗