

Systems of Equations: EOC Prep

Spring 2013

Name: Key

Directions: The following questions are sample items similar to those found on the EOC Exam. Answer each to the best of your ability.



1. Only chocolate and vanilla ice cream cones are sold at an ice cream store. In one day, the number of chocolate cones sold was 1 more than 4 times the number of vanilla cones sold. A total of 121 cones were sold that day.

Let c = the number of chocolate cones sold.
Let v = the number of vanilla cones sold.

- Write equations to determine the number of chocolate cones sold that day.
- Use the equations to determine the number of chocolate cones sold that day.

Show your work using words, numbers, and/or diagrams.

$$C = 4v + 1$$

$$C + v = 121$$

$$4v + 1 + v = 121$$

$$5v + 1 = 121$$

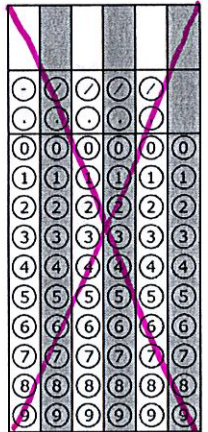
$$5v = 120$$

$$v = 24 \text{ vanilla cones}$$

$$C = 4(24) + 1$$

$$C = 96 + 1$$

$$C = 97 \text{ chocolate cones}$$



2. The math club sells candy bars and drinks during football games.

- 60 candy bars and 110 drinks will sell for \$265.
- 120 candy bars and 90 drinks will sell for \$270.

How much does each candy bar sell for?

(Note: Express the answer in dollars.cents.)

x = \$ of candy bars
 y = \$ of drinks

$$(60x + 110y = 265) - 2$$

$$120x + 90y = 270$$

$$\begin{array}{r} -120x - 220y = -530 \\ 120x + 90y = 270 \\ \hline -130y = -260 \\ y = \$2 \end{array}$$

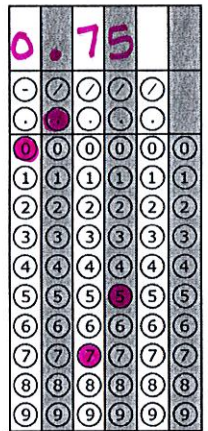
$$60x + 110(2) = 265$$

$$60x + 220 = 265$$

$$60x = 45$$

$$x = 45/60 = 15/20 = 3/4 = 0.75$$

$$\begin{array}{r} 0.75 \\ 60 \overline{) 45.00} \\ \underline{-420} \\ 300 \\ \underline{-300} \\ 0 \end{array}$$



3. Two times Antonio's age plus three times Sarah's age equals 34. Sarah's age is also five times Antonio's age. How old is Sarah?

Antonio: x
Sarah: $5x$

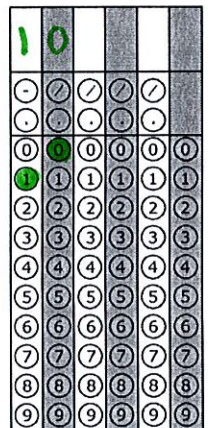
$$2x + 3(5x) = 34$$

$$2x + 15x = 34$$

$$17x = 34$$

$$x = 2$$

$$\text{Sarah: } 5(2) = 10$$





4. Paul sells chocolate chip cookies and peanut butter cookies.

- Baking a batch of chocolate chip cookies takes 1.75 cups of flour and 2 eggs.
- Baking a batch of peanut butter cookies takes 1.25 cups of flour and 1 egg.
- Paul has 10 cups of flour and 12 eggs.
- He makes \$4 profit per batch of chocolate chip cookies.
- He makes \$2 profit per batch of peanut butter cookies.

$x = \# \text{ of pb cookies}$
 $y = \# \text{ of cc cookies}$

Profit: $2x + 4y$

How many batches of peanut butter cookies should Paul make to maximize his profit?

- A 1
- B 2
- C 5
- D 8

Flour: $1.25x + 1.75y \leq 10$

Eggs: $1x + 2y \leq 12$

A) $(1, 5) \rightarrow 2(1) + 4(5) = 22$

B) $(2, 4) \rightarrow 2(2) + 4(4) = 20$

C) $(5, 2) \rightarrow 2(5) + 4(2) = 18$

D) $(8, 0) \rightarrow 2(8) + 4(0) = 16$

5. A company produces packs of pencils and pens.

- The company produces at least 100 packs of pens each day, but no more than 240.
- The company produces at least 70 packs of pencils each day, but no more than 170.
- A total of less than 300 packs of pens and pencils are produced each day.
- Each pack of pens makes a profit of \$1.25.
- Each pack of pencils makes a profit of \$0.75.

$x = \# \text{ of pens}$

$y = \# \text{ of pencils}$

Profit: $1.25x + 0.75y$

What is the maximum profit the company can make each day?

- A \$338.75
- B \$344.25
- C \$352.50
- D \$427.50

$x \geq 100$ $y \geq 70$ $x + y < 300$

$x \leq 240$ $y \leq 170$

Profit = $1.25(229) + 0.75(70)$
 $= \$338.75$

Company wants to make as many pens as possible b/c they make a larger profit.

$299 - 70 = 229$
 ↑ ↑ ↑
 less than 300 # of pencils max # of pens
 that must be made

6. John mixed cashews and almonds.

- John bought 4 pounds of almonds for a total cost of \$22.
- The cost per pound for cashews is 60% more than the cost per pound for almonds.
- John bought enough cashews that, when he mixed them with the almonds, the mixture had a value of \$6.50 per pound.

$a = \text{almonds}$

$c = \text{cashews}$

100% almonds + 60% = 1.6a

Approximately what percent of the mixture, by weight, was cashews?

- A 20%
- B 25%
- C 30%
- D 35%

$4a = 22$

$a = \$5.50$

$c = 1.6a$

$c = 1.6(5.50)$

$c = \$8.80$

	Price	%
Almonds	5.50	100 - x
Cashews	8.80	x
Total	6.50	100

$5.50(100 - x) + 8.80x = 6.50(100)$

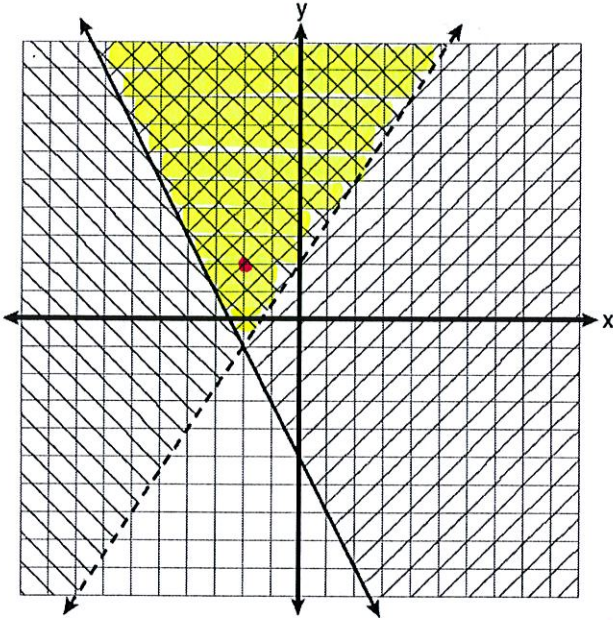
$550 - 5.5x + 8.8x = 650$

$3.3x = 100$

$x = 30.3\%$



7. Which ordered pair is in the solution set of the system of inequalities shown in the graph below?



(1) $(-2, -1)$

(3) $(-2, -4)$

(2) $(-2, 2)$

(4) $(2, -2)$

$x - 2y \leq 10$

$2x + y > 0$

$-2y \leq -x + 10$

$y > -2x + 0$

$y \geq \frac{1}{2}x - 5$

* Dotted

* solid

* $m = -\frac{2}{1}$

* $m = \frac{1}{2}$

$y\text{-int} = -5$

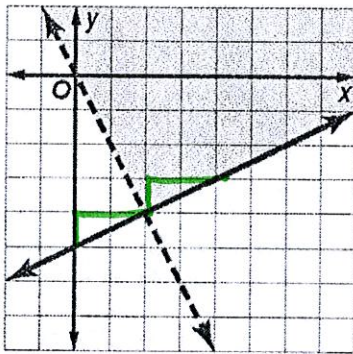
* $y\text{-int} = 0$

8. Which is the graph of the solution set of the system of inequalities?

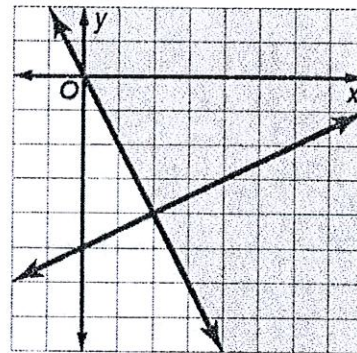
$x - 2y \leq 10$

$2x + y > 0$

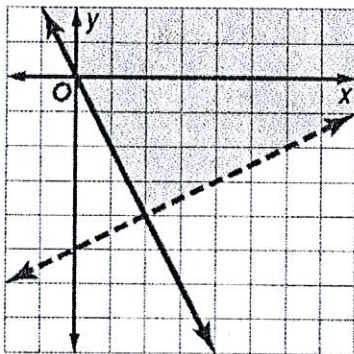
(A)



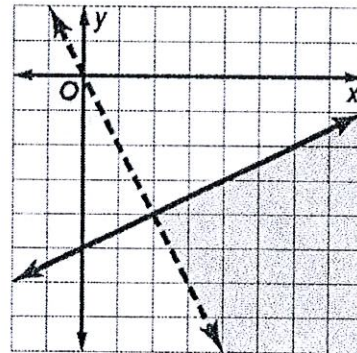
B



C



D





9. Lucy and Barbara began saving money the same week. The table below shows the models for the amount of money Lucy and Barbara had saved after x weeks.

Lucy's Savings	$f(x) = 10x + 5$
Barbara's Savings	$g(x) = 7.5x + 25$

After how many weeks will Lucy and Barbara have the same amount of money saved?

- A 1.1 weeks
 B 1.7 weeks
 C 8 weeks
 D 12 weeks

$$10x + 5 = 7.5x + 25$$

$$2.5x + 5 = 25$$

$$2.5x = 20$$

$$x = 8$$

#10. $4 > 2(1) + 1$

$$4 > 3 \checkmark$$

$$6 > 2(1) + 1$$

$$6 > 3 \checkmark$$

$$8 > 2(3) + 1$$

$$8 > 7 \checkmark$$

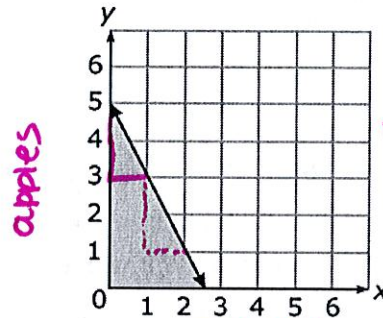
$$5 > 2(2) + 1$$

$$5 > 5 \text{ NO!}$$

10. Which ordered pair is *not* in the solution set of $y > 2x + 1$?

[1] (1,4) [2] (1,6) [3] (3,8) [4] (2,5)

11. What scenario could be modeled by the graph below?



$$b = 5$$

$$m = -\frac{2}{1}$$

shaded below = $<$
 solid line = or = to

$$y \leq -2x + 5 \quad \leftarrow \text{slope-int.}$$

$$2x + y \leq 5 \quad \leftarrow \text{standard.}$$

- A The number of pounds of apples, y , minus two times the number of pounds of oranges, x , is at most 5. $y - 2x \leq 5$

- B The number of pounds of apples, y , minus half the number of pounds of oranges, x , is at most 5. $y - \frac{1}{2}x \leq 5$

- C The number of pounds of apples, y , plus two times the number of pounds of oranges, x , is at most 5. $y + 2x \leq 5$

- D The number of pounds of apples, y , plus half the number of pounds of oranges, x , is at most 5. $y + \frac{1}{2}x \leq 5$