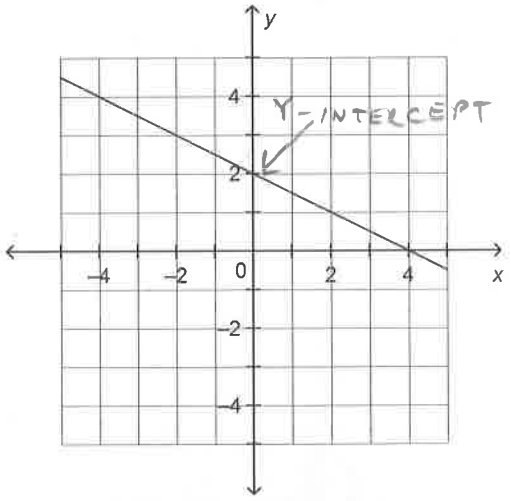
Ch. 6 Practice Test

Multiple Choice
Identify the choice that best completes the statement or answers the question.

C 1. The slope of this line is $-\frac{1}{2}$. What is the equation of the line?



a. $y = \frac{1}{2}x + 2$
c. $y = -\frac{1}{2}x + 2$
b. $y = x + 2$
d. $y = x - \frac{1}{2}$

A 2. Determine the slope and y-intercept of the graph of this equation: $y = -\frac{3}{2}x + 9$

a. slope: $-\frac{3}{2}$; y-intercept: 9
c. slope: -3; y-intercept: 2
b. slope: 9; y-intercept: $-\frac{3}{2}$
d. slope: $\frac{3}{2}$; y-intercept: 3

B 3. What is the y-intercept of $3x + 5y = 15$?

$-3x \quad -3x$
$\frac{5y}{5} = \frac{-3x}{5} + \frac{15}{5}$
$Y = \frac{-3}{5}x + 3$

a. 5
c. 15
b. 3
d. 8

B 4. What is the y-intercept of $y = -3x + 3$

a. -3
b. 3
c. 1
d. -1

D 5. What is the slope of the equation: $5x - 4y = 20$

$-5x \quad -5x$
$\frac{-4y}{-4} = \frac{-5x}{-4} + \frac{20}{-4}$
$y = \frac{5}{4}x - 5$

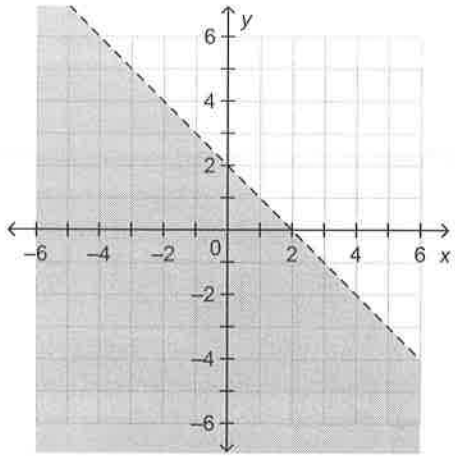
a. 4
b. $\frac{-4}{5}$
c. 5
d. $\frac{5}{4}$

$2x+2y>4$
$-2x \quad -2x$
$\frac{2y}{2} > \frac{-2x}{2} + \frac{4}{2}$
$y > -x+2$

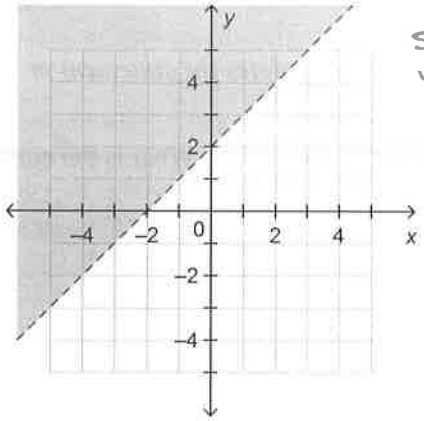
SHADE ABOVE WITH DOTTED LINE

____ 6. Match the inequality $2x + 2y > 4$ to its graph.

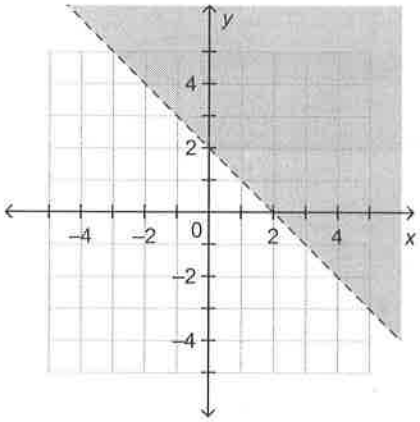
a.



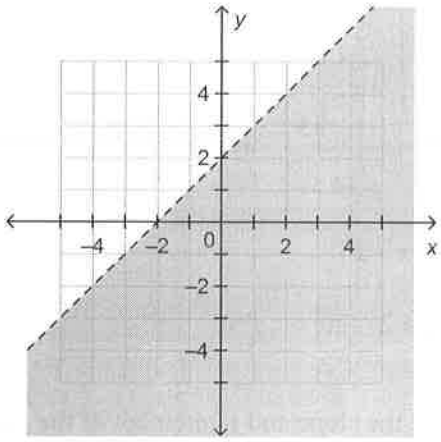
c.



b.



d.



B ____ 7. Which coordinates are a solution of the inequality $2x - 2y < 0$?

TEST EACH COORDINATE

a. (5, 2) b. (2, 5) c. (0, 0) d. (3, 3)

a $2(5)-2(2)<0$
$10-4<0$
$6<0$
NO, SO (5,2) IS NOT A SOLUTION

C ____ 8. Which coordinates are a solution of the inequality $4x - 4y < 4$?

TEST EACH COORDINATE

a. (3, 1) b. (–2, –3) c. (0, 0) d. (1, 0)

D ____ 9. Which of the ordered pairs produces the minimum value?

$C = -2x + 5y$

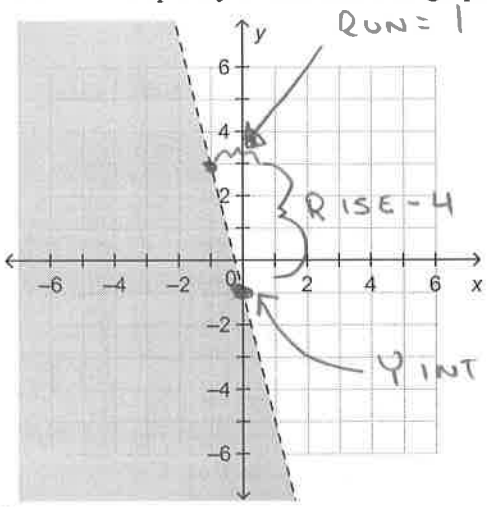
a. (–5, 1) b. (0, –1) c. (10, 3) d. (8, 2)

* 7, 8 HAVE SEVERAL DIFFERENT WAYS TO SOLVE

VERTEX	$C = -2x+5y$
(-5, 1)	$C = -2(-5)+5(1) = 15$
(0, -1)	$C = -2(0)+5(-1) = -5$
(10, 3)	$C = -2(10)+5(3) = -5$
(8, 2)	$C = -2(8)^2+5(2) = -6$

↑ MIN VALUE

A 10. Write an inequality to describe this graph.

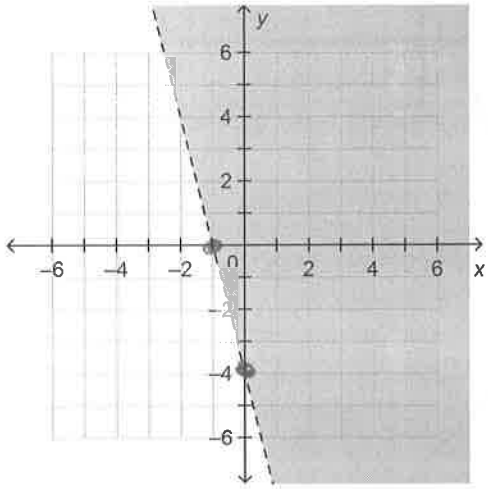


- SLOPE = $\frac{-4}{1}$
- DOTTED LINE
- SHADE BELOW
- y-INT = -1

$y < -4x - 1$

(a.) $y < -4x - 1$ b. $y \leq -4x + 1$ c. $y > -4x + 1$ d. $y \geq -4x - 1$

B 11. Write an inequality to describe this graph.



- SLOPE = $\frac{-4}{1}$
- DOTTED LINE
- SHADE ABOVE
- y INT = -4

$y > -4x - 4$

a. $y \geq -4x + 4$ (b.) $y < -4x - 4$ c. $y \leq -4x + 4$ d. $y > -4x - 4$

Matching. Make sure you also know when to shade above/below and when to use a solid or dotted line.

a. $\leq$ c. $<$
b. $>$ d. $\geq$

B 12. greater than - dotted line & shade above

A 13. less than or equal to - solid line & shade below

C 14. less than - dotted line & shade below

D 15. greater than or equal to - solid line & shade above

Short Answer

16. Graph the system:

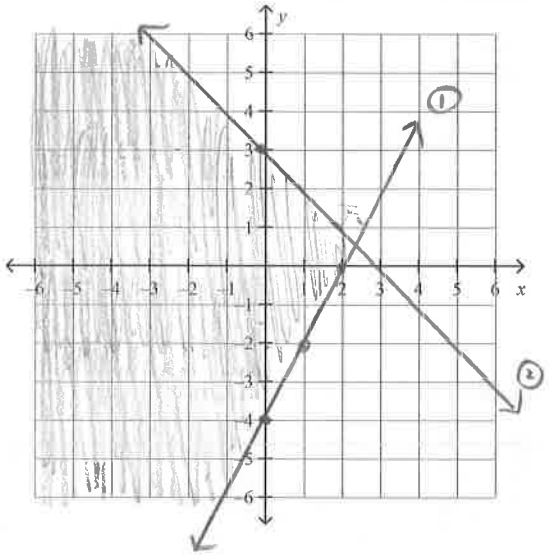
$y \geq 2x - 4$ ①

$2x + 2y \leq 6$ ②

$-2x \quad -2x$

$\frac{2y}{2} \leq \frac{-2x}{2} + \frac{6}{2}$

$y \leq -x + 3$ ②



17. Graph the system:

① $x + y \leq 6$

② $x - 2y \leq 4$

$x \geq 0$

① $x + y \leq 6$

$-x \quad -x$

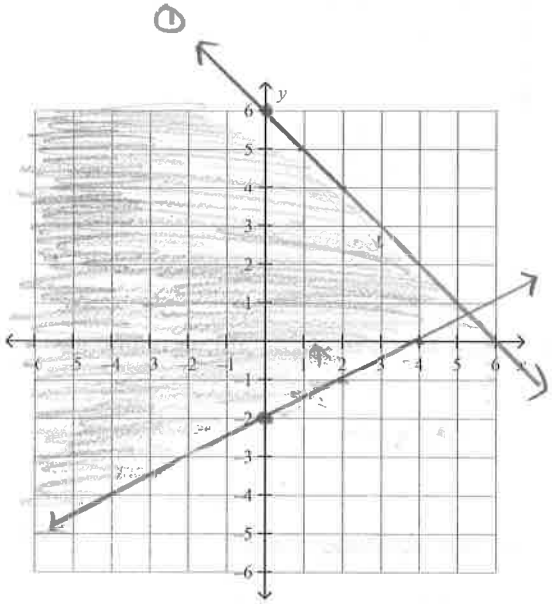
$y \leq -x + 6$

② $x - 2y \leq 4$

$-x \quad -x$

$\frac{-2y}{-2} \leq \frac{-x}{-2} + \frac{4}{-2}$

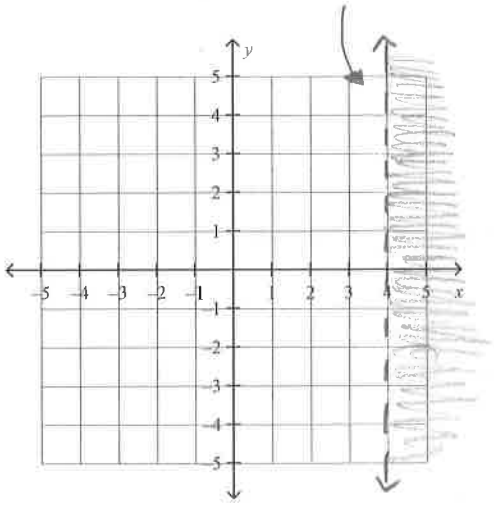
$y \geq \frac{1}{2}x - 2$



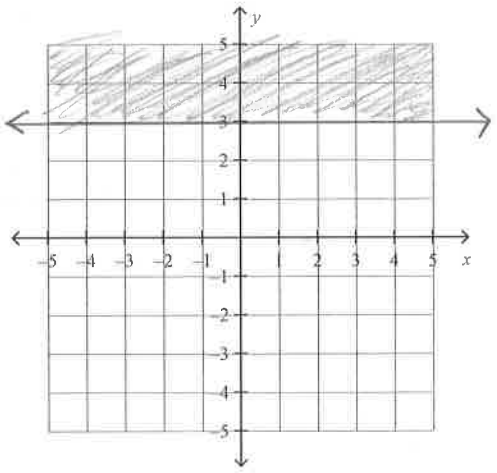
18. Graph the inequality:

$x > 4$

DOTTED LINE



$y \geq 3$



19. a) Is $(0, 2)$ a solution to $4x - 3y \geq 2$?

$4(0) - 3(2) \geq 2$

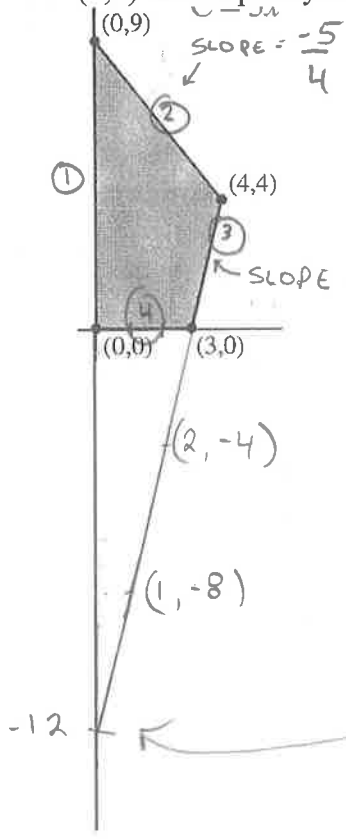
$-6 \geq 2$ NOT TRUE **NO**

b) Is $(1, 2)$ a solution to $3x + 2y = 7$?

$3(1) + 2(2) = 7$

$3 + 4 = 7$ TRUE **YES**

20. Write the system of inequalities that would create the shape below. (The line connecting (4,4) and (3,0) will require you to extend the line to be able to see the y-int.



① $X \geq 0$

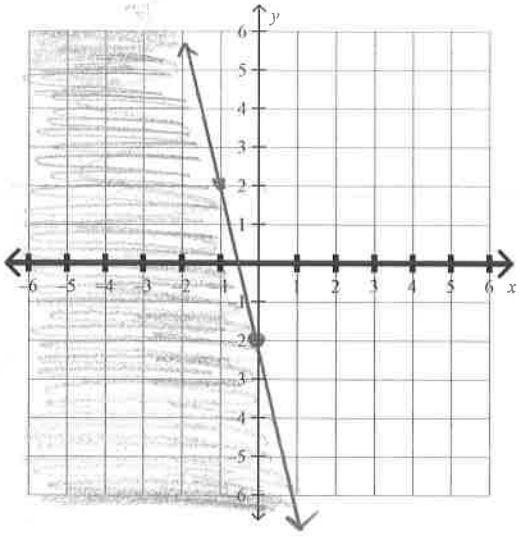
② $Y \leq -\frac{5}{4}X + 9$

③ $Y \geq 4X - 12$

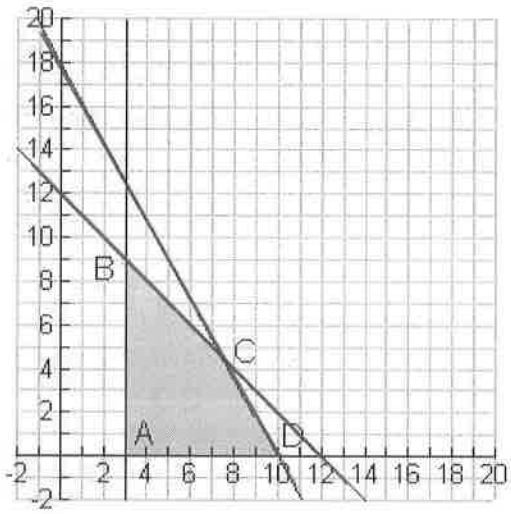
④ $Y \geq 0$

FINDING Y-INT HERE IS A BIT TRICKY

21. Graph the inequality: $y \leq -4x - 2$



22. Write a system of inequalities for the graph below. It is kinda hard to determine which letter is pointing to which line. B is the vertical line. A is the horizontal line, D has a y-int = 18 and C has a y-int of 12.



(A) $Y \geq 0$

(B) $x \geq 3$

(C) $y \leq -x + 12$

(D) ~~$y \leq -2x + 18$~~

SLOPE LOOKS LIKE $\frac{-2}{1}$ BUT REALLY ITS

$\frac{-18}{10} = \frac{-9}{5}$

(D) $y \leq -\frac{9}{5}x + 18$

23. Solve using the addition method. (hint: coefficients need to have same # but opp. sign. You will also want x and y on the same side of equation)

$y = 3x + 4$ and $2x - 3y = 2$

$3[-3x + y = 4]$

$-9x + 3y = 12$

$+ \quad 2x - 3y = 2$

$-7x + 0 = 14$

$\frac{-7x}{-7} = \frac{14}{-7}$

$x = -2$

USE $x = -2$ TO FIND Y-VALUE

$2(-2) - 3y = 2$

$4 - 3y = 2$

$-4 \quad -4$

$\frac{-3y}{-3} = \frac{-2}{-3}$

$y = -2$

$(-2, -2)$

24. Solve using the addition method: $3x - 2y = 6$ & $-6x + 4y = -12$

$2x[3x - 2y = 6]$

$6x - 4y = 12$

$+ \quad -6x + 4y = -12$

$0 + 0 = 0$

TRUE

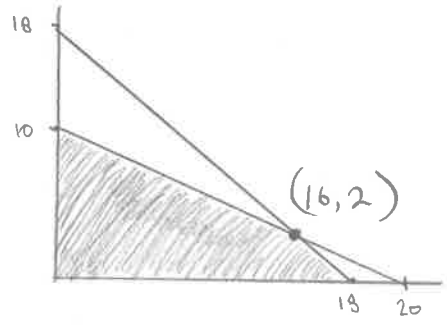
∞ SOLUTIONS

25. A test is made up of multiple choice and open-ended questions. It takes up to 3 minutes to do a multiple choice question, and up to 6 minutes for an open-ended question. Total time is 60 minutes and you may answer no more than 18 questions. Graph the system, and label the corner points.

LET M = MULTIPLE CHOICE AND θ = OPEN ENDED

$M + \theta \leq 18$

$3M + 6\theta \leq 60$



USE ADDITION METHOD TO FIND CORNER POINT

$-3x(M + \theta \leq 18)$

$-3M - 3\theta \leq -54$

$+ \quad 3M + 6\theta \leq 60$

$3\theta \leq 6$

$\theta = 2$

$M + (2) = 18$

$M = 16$

26. a. When do you flip an inequality sign?
b. Create an inequality that has x and y on the same side of the equation that requires you to flip the sign when you change the inequality into $y = mx + b$

a. WHEN MULTIPLYING OR DIVIDING BY A NEGATIVE

b. $x - 3y > 9$

$-x \quad -x$

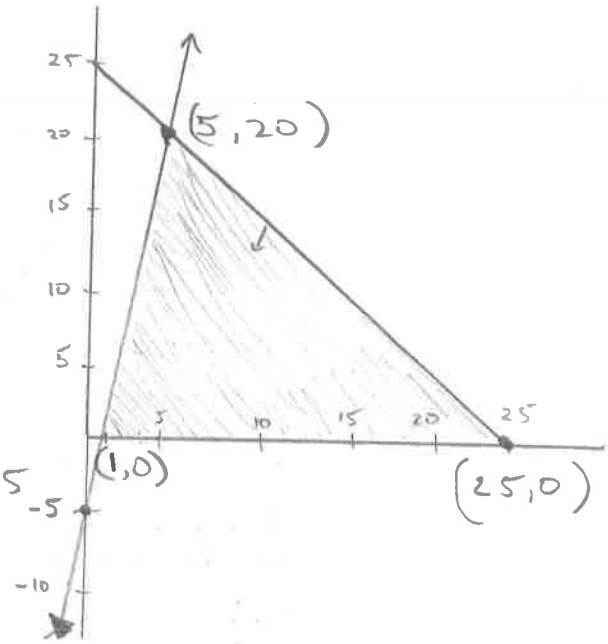
$\frac{-3y}{-3} > \frac{-x}{-3} + \frac{9}{-3}$

$y < \frac{1}{3}x - 3$

27. The following model represents an optimization problem. Determine the maximum solution. Restrictions: (Hint: You need to graph all inequalities, test all vertices (corners of feasible area) with the objective function.

Constraints:
$x > 0$
$y > 0$
① $5x \geq y + 5$
② $x + y \leq 25$

Objective function:
$A = x + 2y$



① $5x \geq y + 5$

$y + 5 \leq 5x$

$-5 \quad -5$

$y \leq 5x - 5$

② $x + y \leq 25$

$y \leq -x + 25$

VERTEX	$A = x + 2y$
(1, 0)	$A = 1 + 2(0) = 1$
(5, 20)	$A = 5 + 2(20) = \boxed{45}$ ← MAX
(25, 0)	$A = 25 + 2(0) = 25$

$\boxed{(5, 20)}$