

**WARM UP**

1) Graph:  $4x - 3y < 12$

2) Graph:  $y < -3|x + 1| + 4$

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1.  $(0.2, 2.5)$
2.  $(-2, 4)$
3.  $(20, 4)$
4.  $(p, q) = (0.75, 2.5)$
5.  $(10, -1)$
6.  $(8, -1)$
7.  $(a, b) = (0, 3)$
8.  $(r, t) = (-6, -9)$
9.  $(-2, -5)$
10.  $(m, n) = (-3, 4)$
11.  $(6, 4)$
12.  $(r, s) = (-6, -6)$
13. a.  $\begin{cases} d = 0.50m \\ d = 15 \end{cases}$
- b. 30 miles
14. 3 vans and 2 sedans, or 4 vans and 1 sedan, or 5 vans and 0 sedans
15. a.  $\begin{cases} p = 28 \\ p = 8 + 0.35d \end{cases}$
- b. 58
16. 2 mi/h, 6 mi/h
17.  $20^\circ, 70^\circ, 90^\circ$
18.  $(7, 5)$
19.  $(2, 4)$
20.  $(a, b) = (-1, 3)$
21.  $(2, -2)$
22.  $(w, y) = (-2, -4)$
23.  $(u, v) = (4, 1)$
24.  $(2, 3)$
25.  $(6, 0)$
26.  $(8, 6)$
27.  $(0, 3)$
28.  $(1, 1)$
29.  $(r, s) = (2, -1)$

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30.  $\{(x, y) | -2x + 3y = 13\}$
31.  $\{(a, d) | -3a + d = -1\}$
32.  $(a, b) = (3, 2)$
33. no solution
34.  $(5, 4)$
35. no solution
36.  $(\frac{20}{17}, \frac{19}{17})$
37.  $(-3, 2)$
38.  $(r, s) = (4, 1)$
39.  $(1, 3)$
53. A 61. a.  $c = 9.95 + 2.25t$ ,  $c = 2.95t$
- b.
- c. about 14.2 h; it is where the graphs intersect.
- d. Answers may vary. Sample: Internet Action, because it would cost \$4.05 less per month

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$$\begin{aligned} \textcircled{6} \quad x + 6y &= 2 \rightarrow x = 2 - 6y \\ 5x + 4y &= 36 \\ 5(2 - 6y) + 4y &= 36 \\ 10 - 30y + 4y &= 36 & x = 2 - 6(-1) \\ 10 - 26y &= 36 & x = 8 \\ -26y &= 26 & (8, -1) \\ y &= -1 \end{aligned}$$

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### 3.3 Graphing and Solving Systems of Linear and Absolute Value Inequalities

Objective: to solve systems of linear inequalities

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#### Steps for Graphing

Graph the lines and appropriate shading for each inequality on the same coordinate plane.

Lines are dotted or solid.

The final shaded area is the section where all the shadings overlap.

\* Sometimes it helps to use a different colored pencil for each line and shaded region.

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4) Solve the system of inequalities by graphing.

$y \geq 3$   
 $y < -|x + 2| + 5$

left 2  
up 5

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## ASSIGNMENT

**HW 3.3**  
**p. 136 #5 - 25 odd,**  
**28, 31, 37,**  
**43-49 odd**

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Tell whether  $(-3, 3)$  is a solution of each system.

4.  $\begin{cases} y \geq x + 2 \\ 3y < -6x + 6 \end{cases}$      5.  $\begin{cases} y - 2x \leq 1 \\ y < -2x - 2 \end{cases}$      6.  $\begin{cases} -2y + x \leq 4 \\ 3y < -9x + 3 \end{cases}$

Solve each system of inequalities by graphing.

7.  $\begin{cases} y \leq 2x + 2 \\ y < -x + 1 \end{cases}$      8.  $\begin{cases} y > -2 \\ x < 1 \end{cases}$      9.  $\begin{cases} y \leq 3 \\ y \leq \frac{1}{2}x + 1 \end{cases}$

10.  $\begin{cases} y \leq 3x + 1 \\ -6x + 2y > 5 \end{cases}$      11.  $\begin{cases} x + 2y \leq 10 \\ x + y \leq 3 \end{cases}$      12.  $\begin{cases} -x - y \leq 2 \\ y - 2x > 1 \end{cases}$

13.  $\begin{cases} y > -2x \\ 2x - y \geq 2 \end{cases}$      14.  $\begin{cases} c \geq d - 3 \\ c < \frac{1}{2}d + 3 \end{cases}$      15.  $\begin{cases} 2x + y < 1 \\ -y + 3x < 1 \end{cases}$

16. **Fund-Raising** You want to bake at least 6 and at most 11 loaves of bread for a bake sale. You want at least twice as many loaves of banana bread as nut bread. Write and graph a system of inequalities to model the situation.

17. **Psychology** A psychologist needs at least 40 subjects for her experiment. She cannot use more than 30 children. Write and graph a system of inequalities.

Solve each system of inequalities by graphing.

18.  $\begin{cases} y > 4 \\ y < |x - 1| \end{cases}$      19.  $\begin{cases} y < -\frac{1}{3}x + 1 \\ y > |2x - 1| \end{cases}$      20.  $\begin{cases} y > x - 2 \\ y \geq |x + 2| \end{cases}$

21.  $\begin{cases} y \leq -\frac{4}{3}x \\ y \geq -|x| \end{cases}$      22.  $\begin{cases} 3y < -x - 1 \\ y \leq |x + 1| \end{cases}$      23.  $\begin{cases} y > -2 \\ y \leq -|x - 3| \end{cases}$

24.  $\begin{cases} -2x + y > 3 \\ y \leq -|x + 4| \end{cases}$      25.  $\begin{cases} 5y \geq 2x - 5 \\ y < |x + 3| \end{cases}$      26.  $\begin{cases} y \geq -3x + 3 \\ y > |x + 2| \end{cases}$

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In Exercises 30–39, identify the inequalities A, B, and C for which the given ordered pair is a solution.

A.  $x + y \leq 2$     B.  $y \leq \frac{3}{2}x - 1$     C.  $y > -\frac{1}{3}x - 2$

30. (0, 0)    31. (-2, -5)    32. (-2, 0)    33. (0, -2)    34. (-15, 15)  
 35. (3, 2)    36. (2, 0)    37. (-6, 0)    38. (4, -1)    39. (-8, -11)

Solve each system of inequalities by graphing.

43.  $\begin{cases} x + y < 8 \\ x \geq 0 \\ y \geq 0 \end{cases}$     44.  $\begin{cases} 2y - 4x \leq 0 \\ x \geq 0 \\ y \geq 0 \end{cases}$     45.  $\begin{cases} y \geq -2x + 4 \\ x > -3 \\ y \geq 1 \end{cases}$

46.  $\begin{cases} y \leq \frac{2}{3}x + 2 \\ y \geq |x| + 2 \end{cases}$     47.  $\begin{cases} y < x - 1 \\ y > -|x - 2| + 1 \end{cases}$     48.  $\begin{cases} 2x + y \leq 3 \\ y > |x + 3| - 2 \end{cases}$

**Geometry** Write a system of inequalities to describe each shaded figure.

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