

9.1 Linear Inequalities in Two Variables

Practise

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1. Which of the ordered pairs are solutions to the given inequality?

c) $3x - 2y > 12$,
 $\{(6, 3), (12, -4), (-6, -3), (5, 1)\}$

Sub values

$$(6, 3) \quad 3(6) - 2(3) > 12$$
$$12 > 12 \quad \underline{\underline{\text{no}}}$$

$$(12, -4) \quad 3(12) - 2(-4) > 12$$
$$44 > 12 \quad \underline{\text{yes}}$$

$$(-6, -3) \quad 3(-6) - 2(-3) > 12$$
$$-12 > 12 \quad \underline{\text{no}}$$

$$(5, 1) \quad 3(5) - 2(1) > 12$$
$$13 > 12 \quad \underline{\underline{\text{yes}}}$$

2. Which of the ordered pairs are *not* solutions to the given inequality?

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c) $4x - 3y < 10$,

$\{(1, 3), (5, 1), (-2, -3), (5, 6)\}$

$(1, 3) \quad 4 - 3(3) < 10?$
 $-5 < 10 \quad \text{yes}$

$(5, 1) \quad 4(5) - 3(1) < 10?$
 $17 < 10 \quad \text{no}$

$(-2, -3) \quad 4(-2) - 3(-3) < 10?$
 $1 < 10 \quad \text{yes.}$

$(5, 6) \quad 4(5) - 3(6) < 10?$
 $2 < 10? \quad \text{yes}$

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3. Consider each inequality.

- Express y in terms of x , if necessary.
Identify the slope and the y -intercept.

c) $4x + y > 7$

- Indicate whether the boundary should be a solid line or a dashed line.

d) $2x - y \leq 10$

c) $4x + y > 7$

$y > 7 - 4x$ OR $y > -4x + 7$

↑
dotted line

d) $2x - y \leq 10 \longrightarrow 2x - 10 \leq y$

$-y \leq -2x + 10$

$y \geq 2x - 10$

↑
solid.

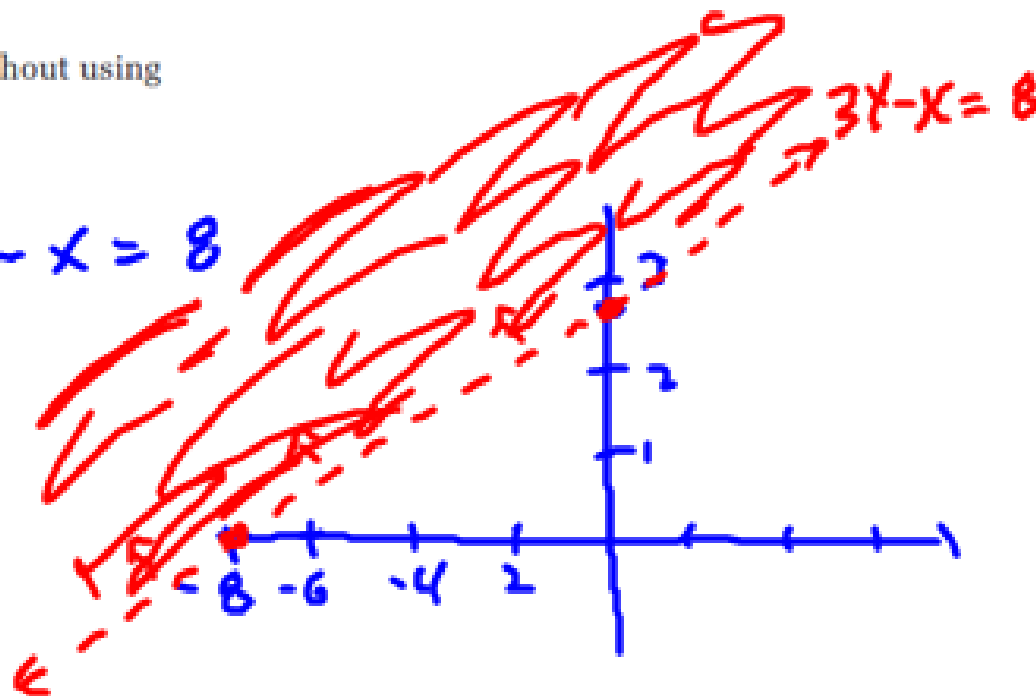
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4. Graph each inequality without using technology.

b) $3y - x \geq 8$

boundary $3y - x = 8$

x	y
0	$8/3$
-8	0



dotted

point check (0,0)

$$0 > 8$$

\therefore not in region

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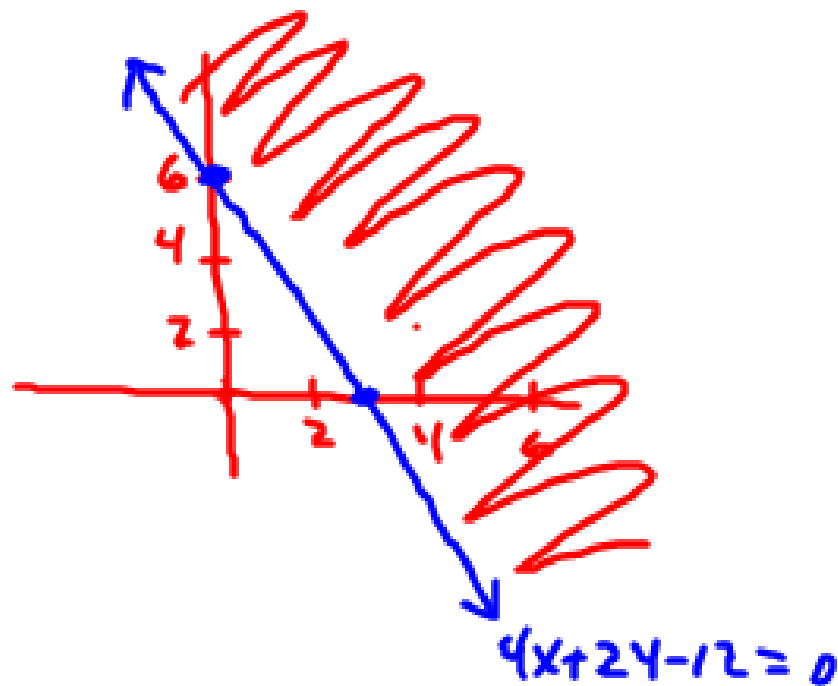
4. Graph each inequality without using technology.

c) $4x + 2y - 12 \geq 0$

boundary $4x + 2y - 12 = 0$
(solid)

x	y
0	6
3	0

point check (0,0)
 $-12 \geq 0$
not in region



5. Graph each inequality using technology.

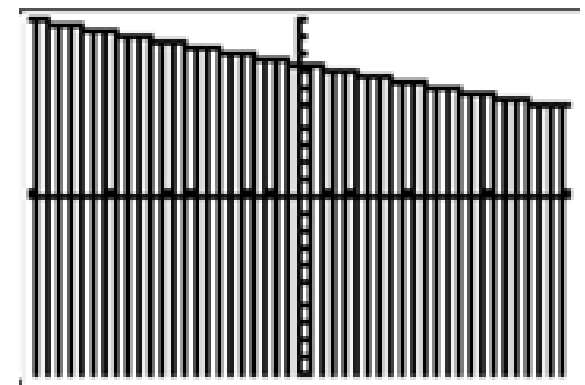
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b) $x + 4y < 30$

$$4y < 30 - x$$

$$y < 7.5 - 0.25x$$

```
Plot1 Plot2 Plot3
Y1 = 7.5 - .25X
Y2 =
Y3 =
Y4 =
Y5 =
Y6 =
Y7 =
```




$$x_{\min} = -10$$

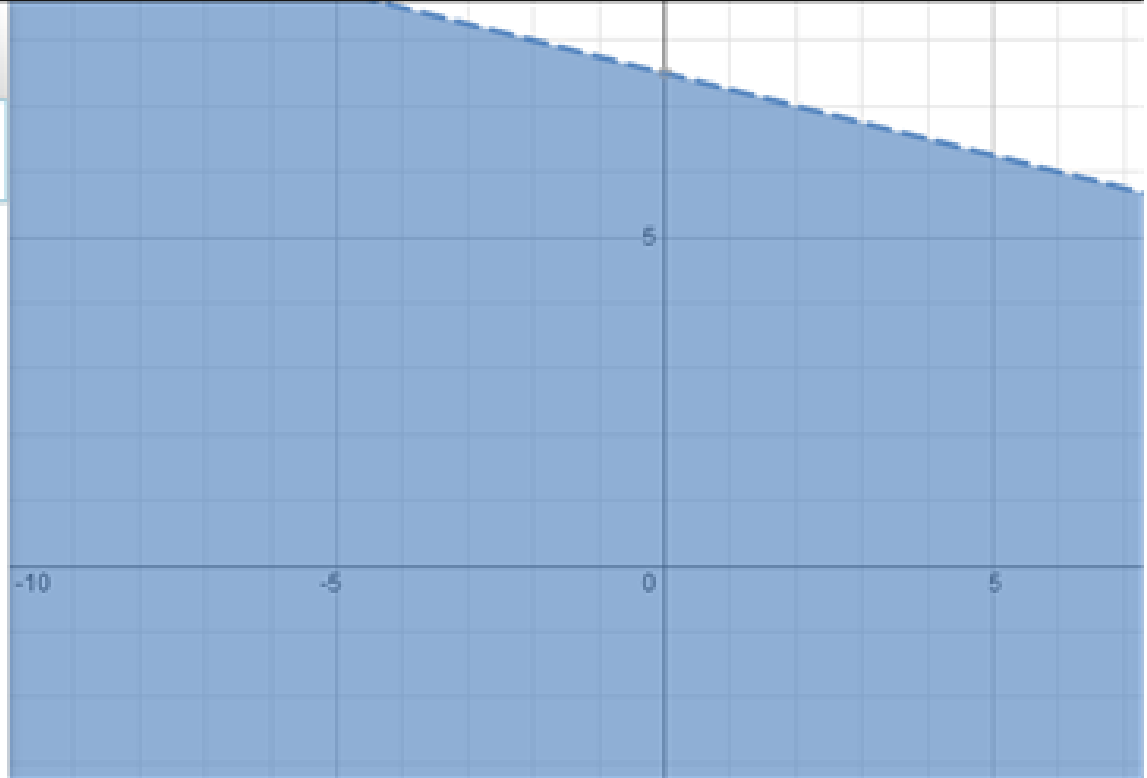
$$x_{\max} = 10$$

$$y_{\min} = -10$$

$$y_{\max} = 10$$

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 $x + 4y < 30$ ✕



Screen Clipping

5. Graph each inequality using technology.

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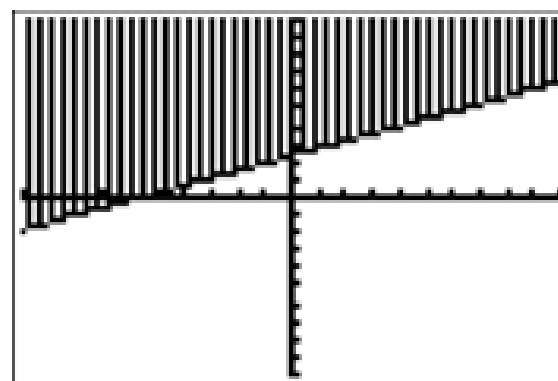
c) $-5x + 12y - 28 > 0$

$$12y > 5x + 28$$

$$y > \frac{5}{12}x + \frac{28}{12}$$

$$y > \frac{5}{12}x + \frac{7}{3}$$

```
Plot1 Plot2 Plot3
Y1 = (5/12)X + (7/3)
Y2 =
Y3 =
Y4 =
Y5 =
Y6 =
```



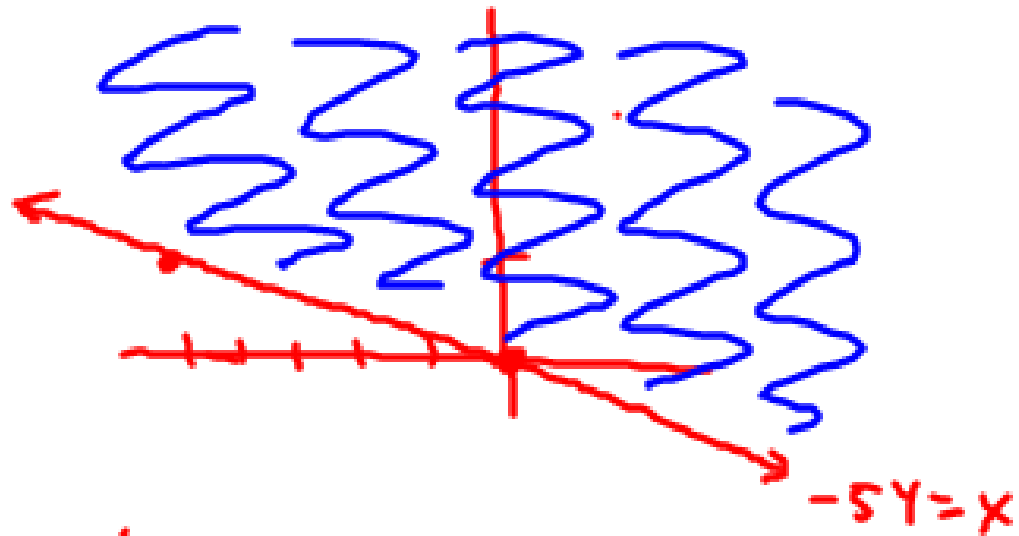
$X_{min} = -10$
 $X_{max} = 10$
 $Y_{min} = -10$
 $Y_{max} = 10$

6. Determine the solution to $-5y \leq x$.

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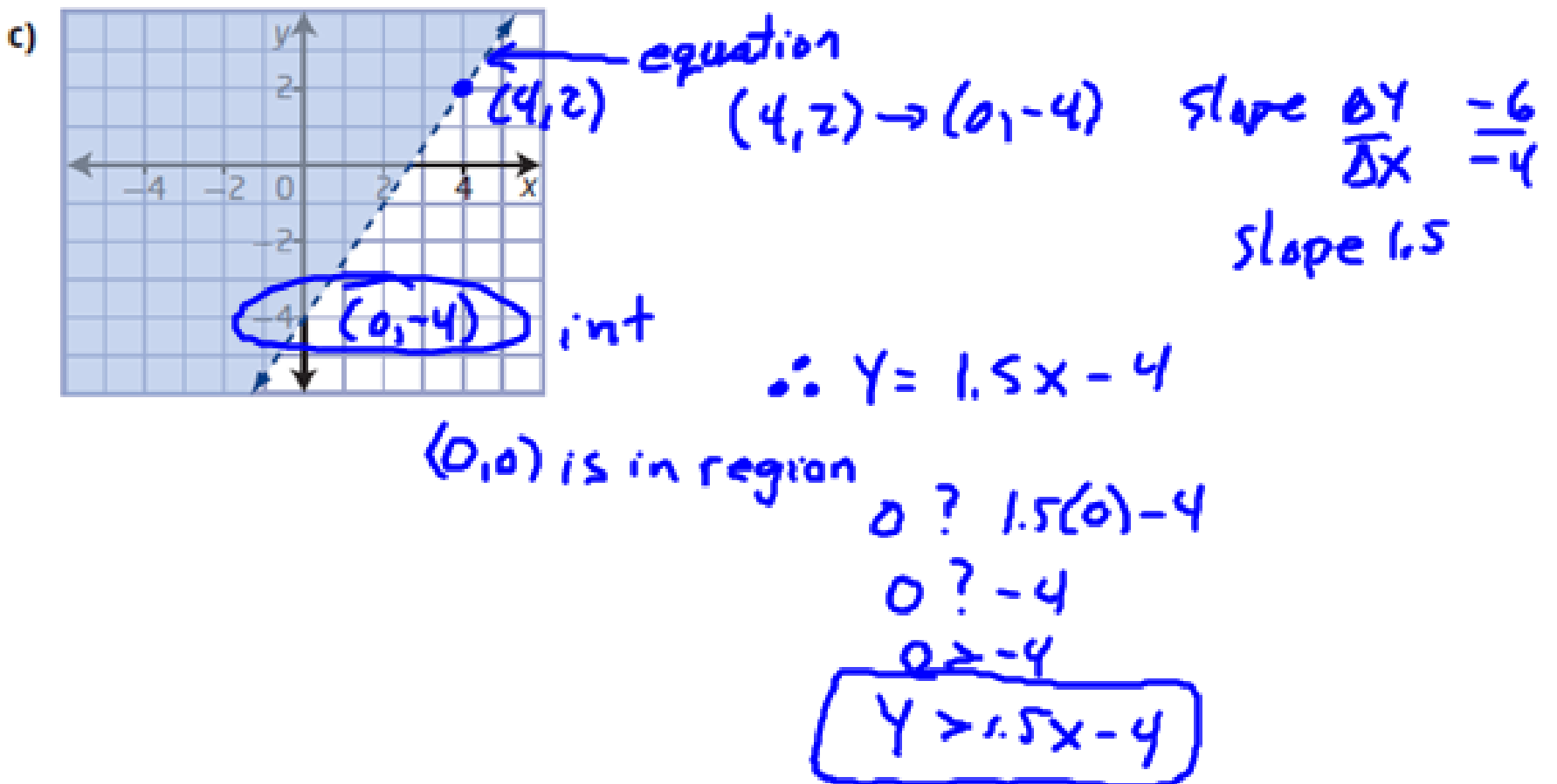
boundary $-5y = x$

x	y
0	0
0	0
-5	1

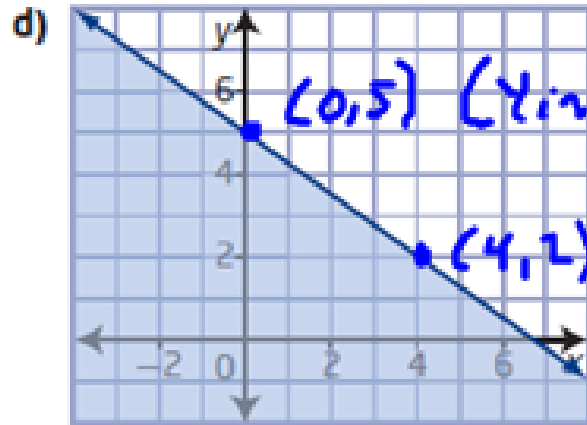


point check $(2, 2)$
 $-10 \leq 2$ ✓
in region

9. Determine the inequality that corresponds to each graph.



9. Determine the inequality that corresponds to each graph.



(0, 5)?

$$\text{slope } \frac{dy}{dx} = -\frac{3}{4} \quad -\frac{3}{4}$$

$$y = -\frac{3}{4}x + 5$$

$$y < -\frac{3}{4}x + 5$$

$$0 < 5 \quad \checkmark$$

$$y \leq -\frac{3}{4}x + 5$$

Homework: 1d, 2d, 3e,f, 4d,e, 5d,e, 7, 9a,b, 17 pgs.472-474