Quadratic Inequalities

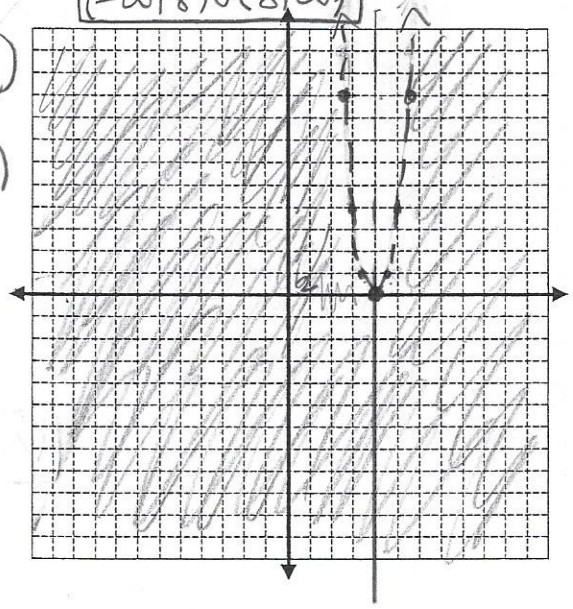
Key

① $(-\infty, 8) \cup (8, \infty)$

(8,0)

X=8

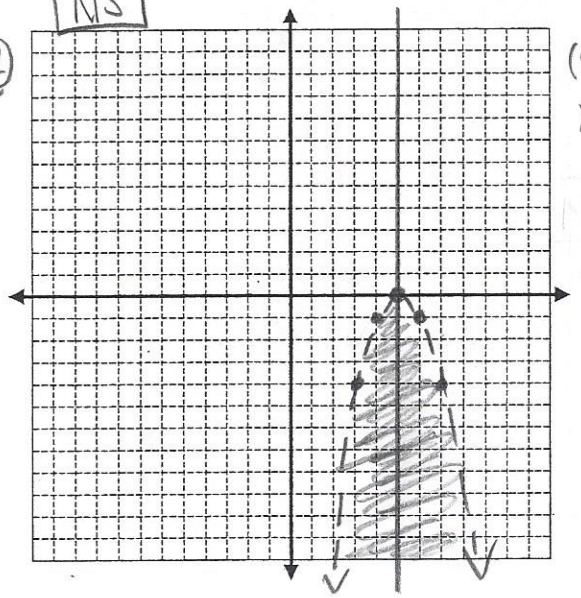
X scale is 2



② NS

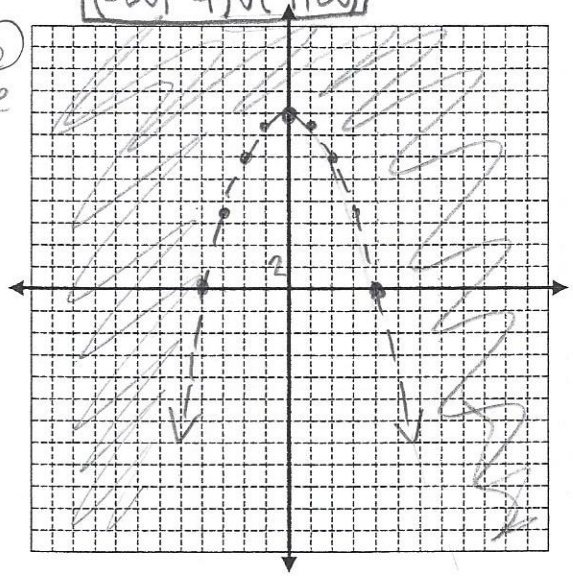
(5,0)

X=5

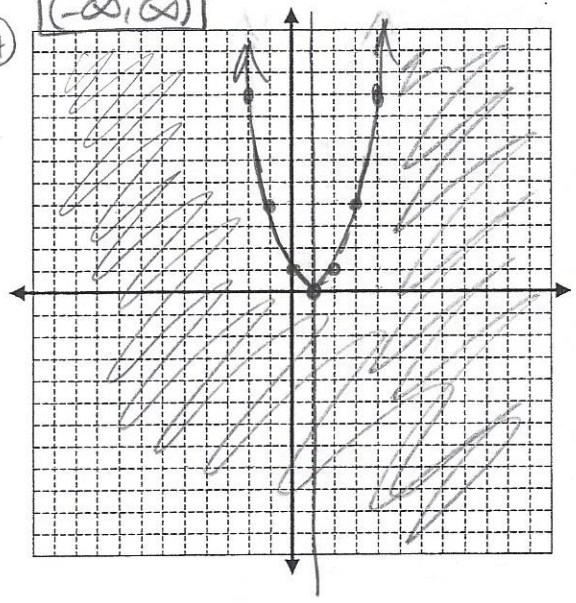


③ $(-\infty, -4) \cup (4, \infty)$

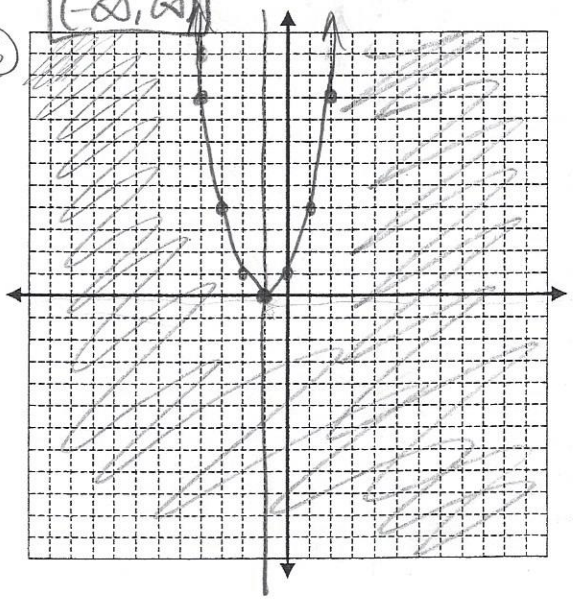
y scale is 2



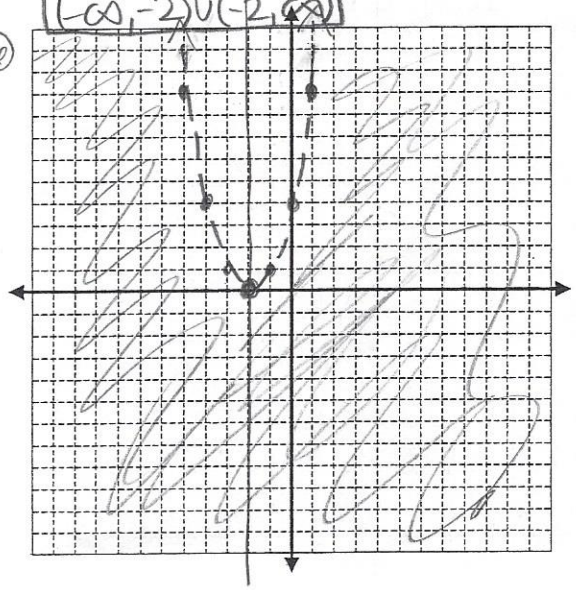
④ $(-\infty, \infty)$



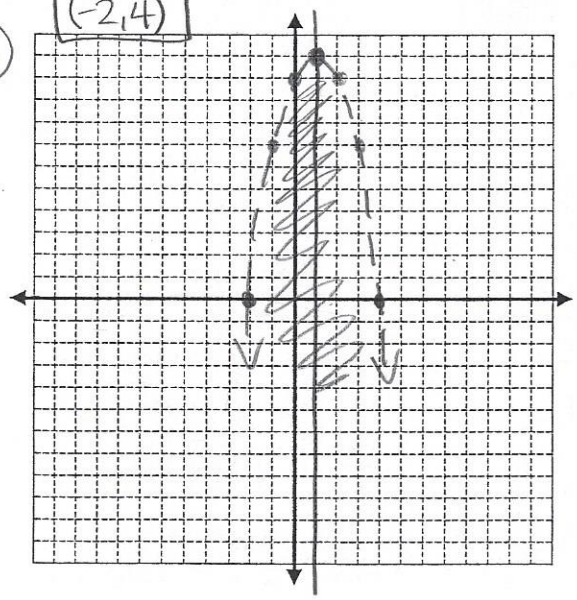
⑤ $(-\infty, \infty)$



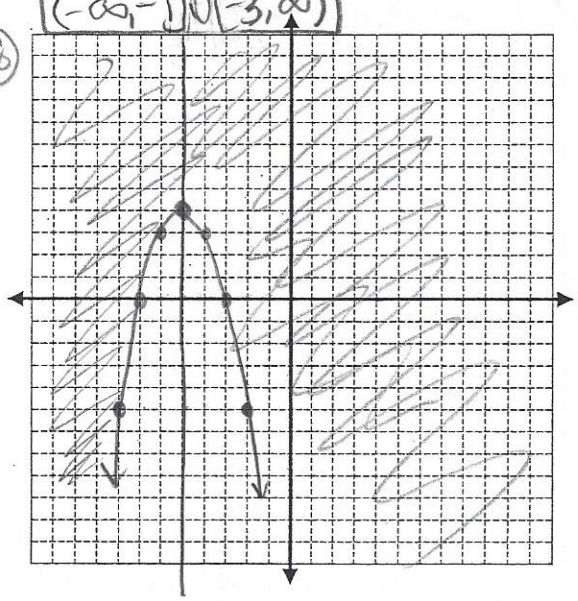
⑥ $(-\infty, -2) \cup (-2, \infty)$



7. $(-2, 4)$

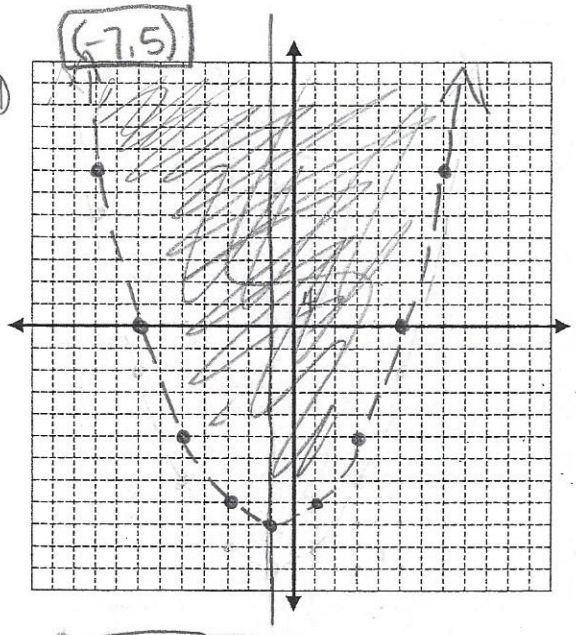


8. $(-\infty, -7] \cup [-3, \infty)$

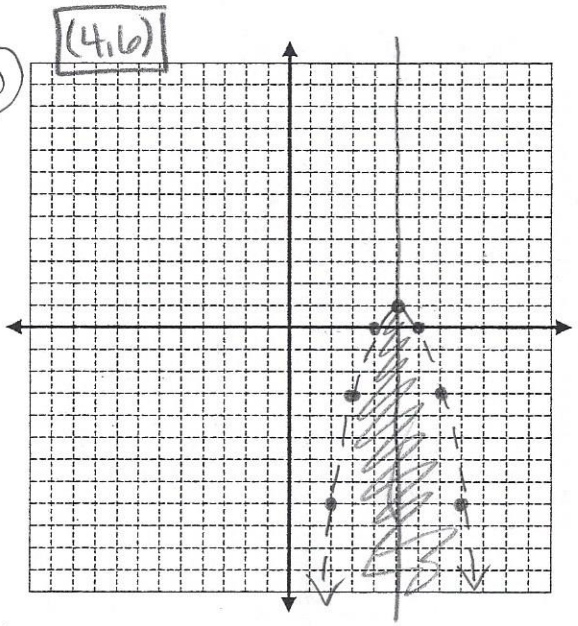


9. $(-7, 5)$

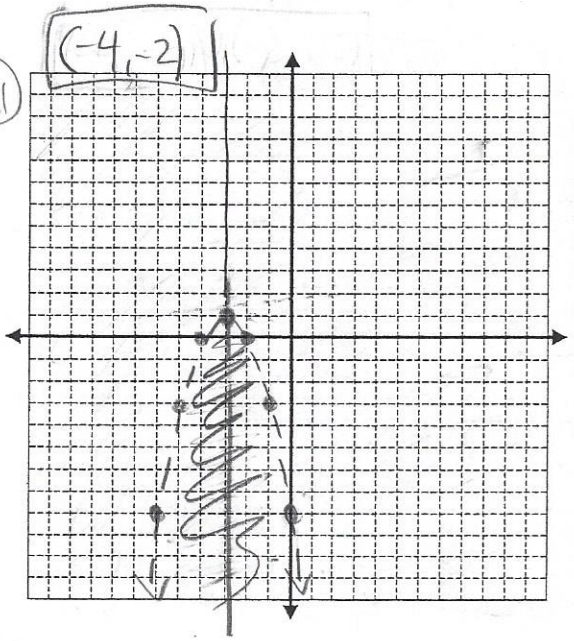
y scale is 4



10. $(4, 6)$

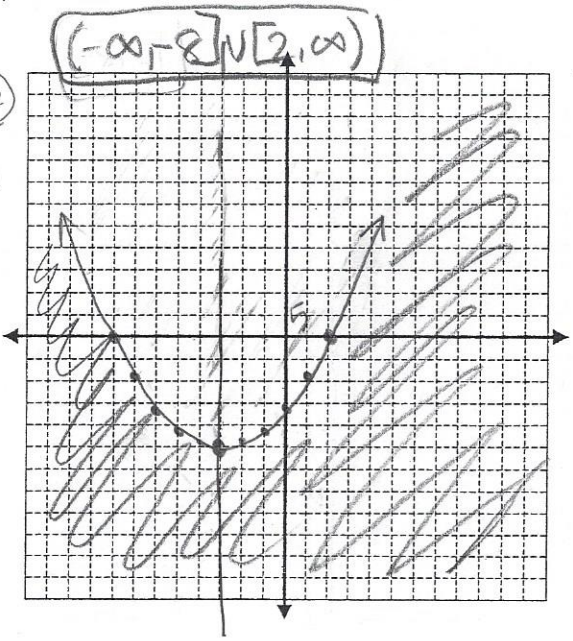


11. $(-4, -2)$

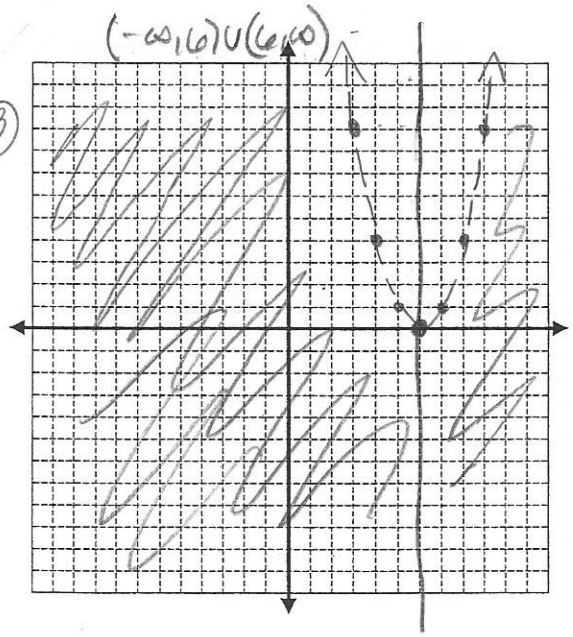


12. $(-\infty, -8] \cup [2, \infty)$

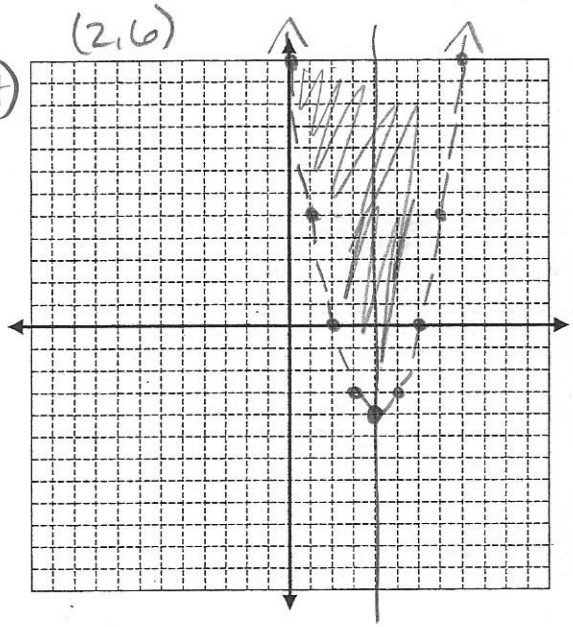
y scale is 5



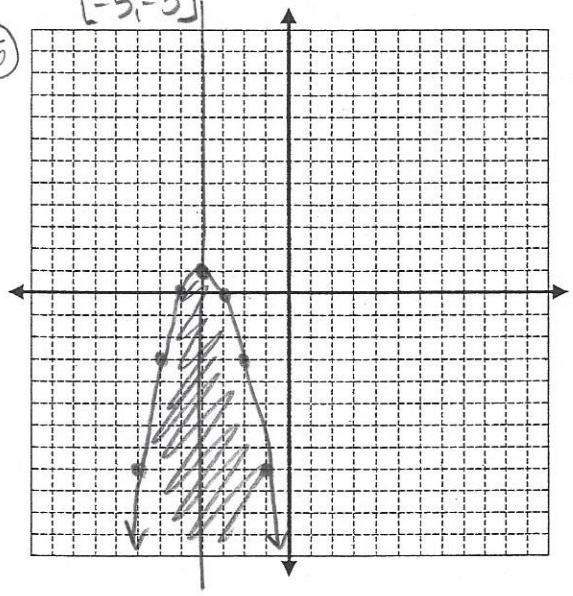
13) $(-\infty, 6) \cup (6, \infty)$



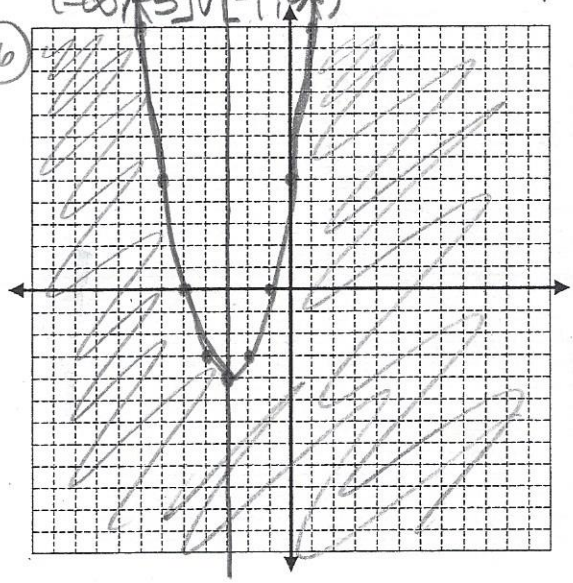
14) $(2, 6)$



15) $[-5, -3]$

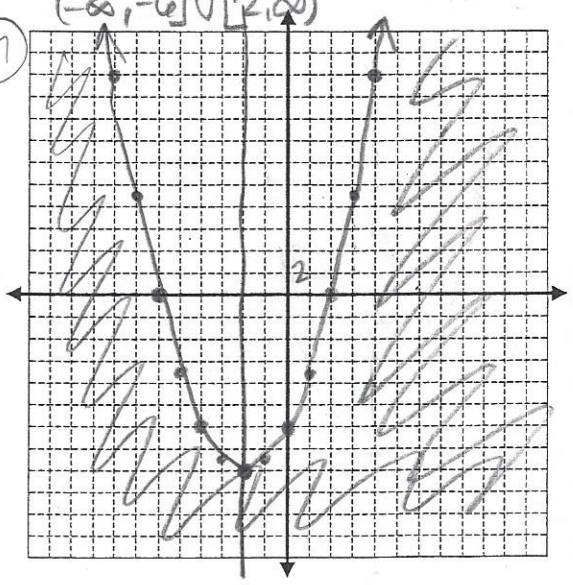


16) $(-\infty, 5] \cup [-1, \infty)$

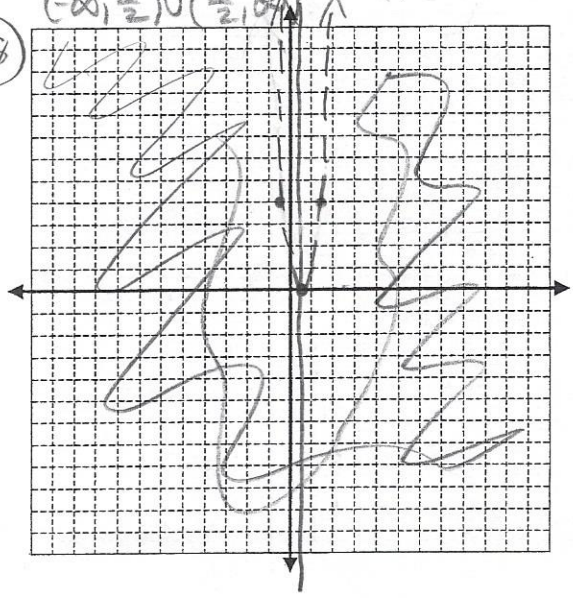


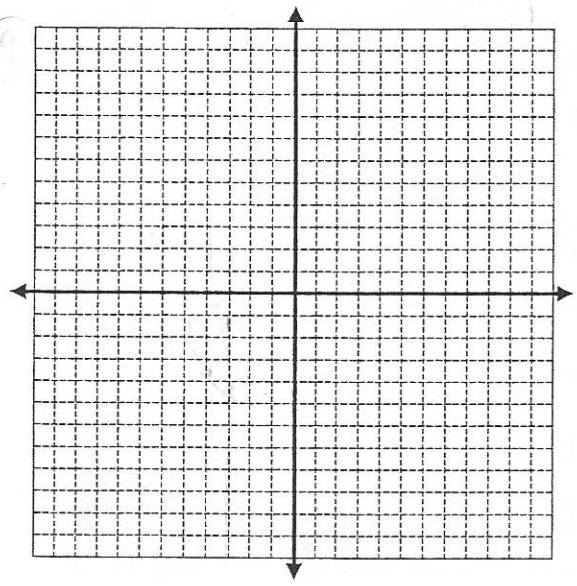
17) $(-\infty, -6] \cup [2, \infty)$

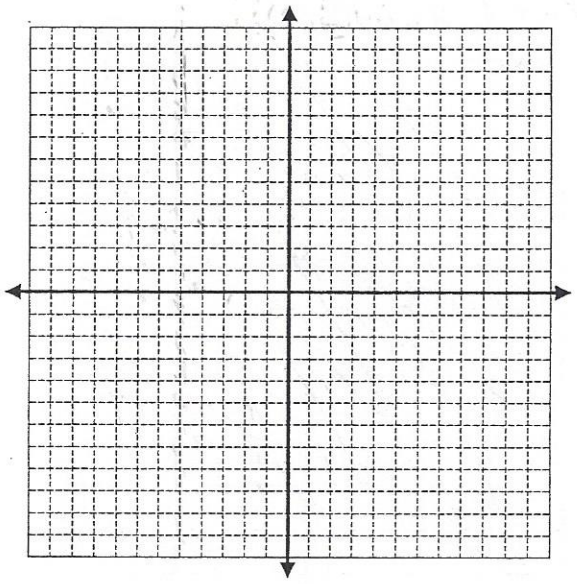
yscale is 2

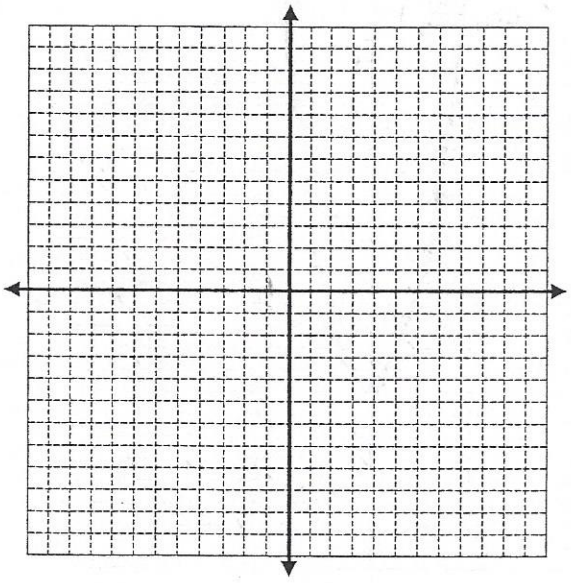


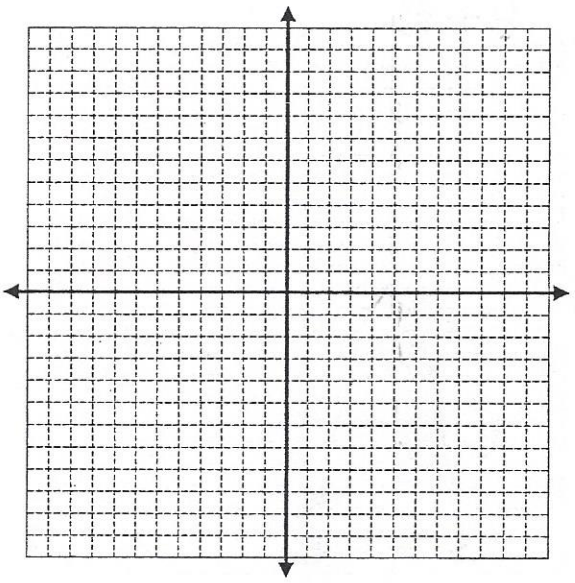
18) $(-\infty, \frac{1}{2}) \cup (\frac{1}{2}, \infty)$



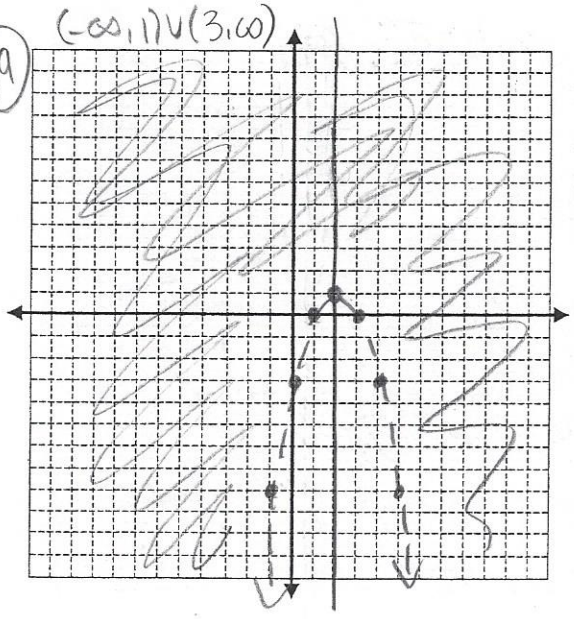






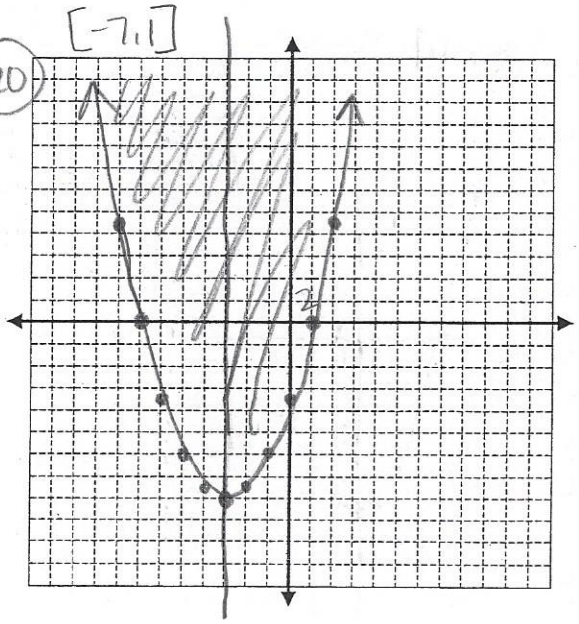


19 $(-\infty, 1] \cup (3, \infty)$



20 $[-7, 1]$

yscale is 2



Algebra 2 # Solutions are x-axis Name Key

Quadratic Inequalities - Use a piece of graph paper

Hour____

Solve each inequality by graphing.

1) $x^2 - 16x + 64 > 0$

$x = \frac{16}{2(1)} = \frac{16}{2}$ $x = 8$ (8,0)

$(8)^2 - 16(8) + 64$

$64 - 128 + 64 = 0$

(0,0) $64 > 0$ ✓

$(-\infty, 8) \cup (8, \infty)$

2) $-x^2 + 10x - 25 > 0$

$x = \frac{-10}{2(-1)} = \frac{-10}{-2}$ $x = 5$

$-(5)^2 + 10(5) - 25$ (5,0)

$-25 + 50 - 25 = 0$

(0,0) $0 + 0 - 25 > 0$

$-25 > 0$ ×

No Solution

3) $-x^2 + 16 < 0$

$x = 0$

(0,16)

(0,0) $16 < 0$ ×

$x = \frac{0}{2(-1)}$

$(-\infty, -4) \cup (4, \infty)$

4) $x^2 - 2x + 1 \geq 0$

$x = \frac{2}{2(1)} = \frac{2}{2}$ $x = 1$

$1 - 2 + 1 = 0$ (1,0)

(0,0) $1 \geq 0$ ✓

$(-\infty, \infty)$

5) $x^2 + 2x + 1 \geq 0$

$x = \frac{-2}{2(1)} = \frac{-2}{2}$ $x = -1$

$1 - 2 + 1 = 0$ (-1,0)

(0,0) $1 \geq 0$ ✓

$(-\infty, \infty)$

6) $x^2 + 4x + 4 > 0$

$x = \frac{-4}{2(1)} = \frac{-4}{2}$ $x = -2$

$4 - 8 + 4 = 0$ (-2,0)

(0,0) $4 > 0$ ✓

$(-\infty, -2) \cup (-2, \infty)$

7) $-x^2 + 2x + 8 > 0$

$x = \frac{-2}{2(-1)} = \frac{-2}{-2}$ $x = 1$

$-1 + 2 + 8 = 9$ (1,9)

(0,0) $8 > 0$ ✓

$(-2, 4)$

8) $-x^2 - 10x - 21 \leq 0$

$x = \frac{10}{2(-1)} = \frac{10}{-2}$ $x = -5$

$-25 + 50 - 21 = 4$ (-5,4)

(0,0) $-21 < 0$ ✓

$(-\infty, -7) \cup (-3, \infty)$

9) $x^2 + 2x - 35 < 0$

$x = \frac{-2}{2(1)} = \frac{-2}{2}$ $x = -1$

$1 - 2 - 35 = -36$ (-1,-36)

(0,0) $-35 < 0$ ✓

$(-7, 5)$

10) $-x^2 + 10x - 24 > 0$

$x = \frac{-10}{2(-1)} = \frac{-10}{-2}$ $x = 5$

$-25 + 50 - 24 = 1$ (5,1)

(0,0) $-24 > 0$ ×

$(4, 6)$

11) $-x^2 - 6x - 8 > 0$

$x = \frac{6}{2(-1)} = \frac{6}{-2}$ $x = -3$

$-9 + 18 - 8 = 1$ (-3,1)

(0,0) $-8 > 0$ ×

$(-4, -2)$

12) $x^2 + 6x - 16 \geq 0$

$x = \frac{-6}{2(1)} = \frac{-6}{2}$ $x = -3$

$9 - 18 - 16 = -25$ (-3,-25)

(0,0) $-16 \geq 0$ ×

$(-\infty, -8] \cup [2, \infty)$

13) $x^2 - 12x + 36 > 0$

$x = \frac{12}{2(1)} = \frac{12}{2}$ $x = 6$

$36 - 72 + 36 = 0$ (6,0)

(0,0) $36 > 0$ ✓

$(-\infty, 6) \cup (6, \infty)$

14) $x^2 - 8x + 12 < 0$

$x = \frac{8}{2(1)} = \frac{8}{2}$ $x = 4$

$16 - 32 + 12 = -4$ (4,-4)

(0,0) $12 < 0$ ×

$(2, 6)$

15) $-x^2 - 8x - 15 \geq 0$

$x = \frac{8}{2(-1)} = \frac{8}{-2}$ $x = -4$

$-16 + 32 - 15 = 1$ (-4,1)

(0,0) $-15 \geq 0$ ×

$[-5, -3]$

16) $x^2 + 6x + 5 \geq 0$

$x = \frac{-6}{2(1)} = \frac{-6}{2}$ $x = -3$

$9 - 18 + 5 = -4$ (-3,-4)

(0,0) $5 \geq 0$ ✓

$(-\infty, -5] \cup [-1, \infty)$

17) $x^2 + 4x - 12 \geq 0$

$x = \frac{-4}{2(1)} = \frac{-4}{2}$ $x = -2$

$4 - 8 - 12 = -16$ (-2,-16)

(0,0) $-12 \geq 0$ ×

$(-\infty, -6] \cup [2, \infty)$

18) $4x^2 - 4x + 1 > 0$

$x = \frac{4}{2(4)} = \frac{4}{8}$ $x = \frac{1}{2}$

$1 - 2 + 1 = 0$ $(\frac{1}{2}, 0)$

$1 > 0$ ✓

$(-\infty, \frac{1}{2}) \cup (\frac{1}{2}, \infty)$

19) $-x^2 + 4x - 3 < 0$

$x = \frac{-4}{2(-1)} = \frac{-4}{-2}$ $x = 2$

$-4 + 8 - 3 = 1$ (2,1)

(0,0) $-3 < 0$ ✓

$(-\infty, 1) \cup (3, \infty)$

20) $x^2 + 6x - 7 \leq 0$

$x = \frac{-6}{2(1)} = \frac{-6}{2}$ $x = -3$

$9 - 18 - 7 = -16$ (-3,-16)

(0,0) $-7 \leq 0$ ✓

$[-7, 1]$

① Graph using Std form

* AOS & Vertex

② $>, <$ = dashed line

$\geq, \leq$ = solid line

③ $>, <$ = ( )

$\geq, \leq$ = [ ]

④ ∞ will always be ( )

⑤ All solutions come from x-axis

⑥ Choose point to plug in to check for shading

⑦ Shading inside is intersection $(\#,\#)$ or $[\#,\#]$

⑧ Shading outside is union $(-\infty,\#) \cup (\#,\infty)$ or $(-\infty,\#] \cup [\#,\infty)$