HW #2 p. 9-10 #1-13 odd, 31, 35, 39, 41, 49, 54-57, 59, 81

	Set Builder	Interval Notation
1. $x > 50$	$\{x \mid x > 50, x \in R\}$	$(50, \infty)$
3. $x \leq -4$	$\{x \mid x \leq -4, x \in R\}$	$(-\infty, -4]$
5. $8 < x < 99$	$\{x \mid 8 < x < 99, x \in R\}$	$(8, 99)$
7. $x < -19$ or $x > 21$	$\{x \mid x < -19$ or $x > 21\ x \in R\}$	$(-\infty, -19) \cup (21, \infty)$
9. $\{-0.25, 0, 0.25, 0.50 \ldots\}$	$\{x \mid x = 0.25n, n \geq -1, n \in Z\}$	N/A
11. $x \leq -45$ or $x > 86$	$\{x \mid x \leq -45$ or $x > 86, x \in R\}$	$(-\infty, -45) \cup (86, \infty)$
13. all multiples of 5	$\{x \mid x = 5n, n \in z\}$	N/A

31. $h(y) = -3y^3 - 6y + 9$

a. $h(4) = -3(4)^3 - 6(4) + 9$

$= -3(64) - 24 + 9$

$= -192 - 24 + 9 = \boxed{-207}$

b. $h(-2y) = -3(-2y)^3 - 6(-2y) + 9$

$= -3(-8y^3) + 12y + 9$

$= \boxed{24y^3 + 12y + 9}$

c. $h(5b+3) = -3(5b+3)^3 - 6(5b+3) + 9$

$= -3(5b+3)^2(5b+3) - 30b - 18 + 9$

$= -3(25b^2 + 30b + 9)(5b+3) - 30b - 9$

$= -3(125b^3 + 150b^2 + 45b + 75b^2 + 90b + 27) - 30b - 9$

$= -3(125b^3 + 225b^2 + 135b + 27) - 30b - 9$

$= -375b^3 - 675b^2 - 405b - 81 - 30b - 9$

$= -375b^3 - 675b^2 - 435b - 90$

35. $f(x) = -7 + \frac{6x+1}{x}$

a. $f(5) = -7 + \frac{6(5)+1}{5}$

$= -7 + \frac{30+1}{5}$

$= -7 + \frac{31}{5}$

$= \frac{-35}{5} + \frac{31}{5}$

$= -\frac{4}{5}$ or -0.8

b. $f(-8x) = -7 + \frac{6(-8x)+1}{-8x}$

$= -7 + \frac{-48x+1}{-8x}$

$= -7 + \frac{-48x}{-8x} + \frac{1}{-8x}$

$= -7 + 6 - \frac{1}{8x}$

$= -1 - \frac{1}{8x}$

c. $f(6y+4) = -7 + \frac{6(6y+4)+1}{6y+4}$

$= -7 + \frac{36y+24+1}{6y+4}$

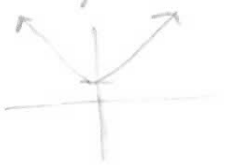
$= -7 + \frac{36y+25}{6y+4}$

39. $f(x) = \frac{8x+12}{x^2+5x+4}$ $(x+4)(x+1) = 0$

$x \neq -4 \quad x \neq -1$

$\{x \mid x \neq -4, x \neq -1 \; x \in R\}$ or $(-\infty, -4) \cup (-4, -1) \cup (-1, \infty)$

41. $g(a) = \sqrt{1+a^2}$ $(-\infty, \infty)$



49. $f(-5) = (-5)^2 + (-5) + 1 = 25 - 5 + 1 = 21$

$f(12) = (12)^2 + 12 + 1 = 144 + 12 + 1 = 157$

54. yes, a vertical line only passes through each point once.

55. no, a vertical line would pass through the inequalitiy infinitely many points.

56. yes, a vertical line only passes through each point once.

57. no, a vertical line would pass through twice at $(0,0)$ and $(0,-4)$.

59. Since the president is elected every 4 years it would not make sense to use interval notation. Elections began in 1792 So set builder notation: $\{x \mid x = 4n + 1792, n \in W\}$

81. $f(x) = \dfrac{1}{(x+3)(x+1)(x-5)}$ $\quad (x+3)(x+1)(x-5) = 0$

$x \neq -3, -1, 5$

Interval Notation

$(-\infty, -3) \cup (-3, -1) \cup (-1, 5) \cup (5, \infty)$

Set Builder

$\{x \mid x \neq -3, x \neq -1, x \neq 5, x \in R\}$

I prefer set builder because instead of listing 4 intervals you can list the values x can't equal.