

Pg. 9-10

8/29/17

#1-13 odd, 31, 35, 39, 41, 49, 53, 54-57, 59, 81

1.  $\{x \mid x > 50, x \in \mathbb{R}\}, (50, \infty)$
3.  $\{x \mid x \leq 4, x \in \mathbb{R}\}, (-\infty, 4]$
5.  $\{x \mid 8 < x < 99, x \in \mathbb{R}\}, (8, 99)$
7.  $\{x \mid x < -19 \text{ or } x > 21, x \in \mathbb{R}\}, (-\infty, 19) \cup (21, \infty)$
9.  $\{x \mid 0.25n = x, n \geq -1, n \in \mathbb{Z}\},$  no interval notation  
 $\begin{array}{ccc} \uparrow & \uparrow & \uparrow \\ \text{multiples of} & \text{starts at} & \text{multiply by} \\ 0.25 & 0.25(-1) = -0.25 & \text{integers} \\ & & \text{only} \end{array}$
11.  $\{x \mid x \leq -45 \text{ or } x > 86, x \in \mathbb{R}\}, (-\infty, -45] \cup (86, \infty)$
13.  $\{x \mid 5n = x, n \in \mathbb{Z}\},$  no interval notation

31. a.  $-3(4)^3 - 6(4) + 9 = -207$

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

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

$24y^3 + 12y + 9$

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

$-3(25b^2 + 30b + 9)(5b+3) - 30b - 18 + 9$

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

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

35. a.  $-7 + \frac{6(5)+1}{5} = -7 + \frac{31}{5} = -\frac{4}{5}$

b.  $-7 + \frac{6(-8x)+1}{-8x} = -7 + \frac{-48x+1}{-8x} = -7 + \frac{48x}{8x} + \frac{1}{-8x} = -1 - \frac{1}{8x}$

c.  $-7 + \frac{6(6y+4)+1}{6y+4} = -7 + \frac{36y+25}{6y+4}$

$$39. \frac{8x+12}{x^2+5x+4} = \frac{4(2x+3)}{(x+4)(x+1)} \quad x \neq -4, x \neq -1$$

$$(-\infty, -4) \cup (-4, -1) \cup (-1, \infty)$$

$$41. 1+a^2 > 0$$

$$a^2 > -1 \quad (\text{this is all real numbers})$$

$$(-\infty, \infty)$$

$$49. f(-5) = -4(-5) + 3 = 23$$

$$f(12) = 3(12)^2 + 1 = 433$$

$$53. 2016 \rightarrow t=4 \quad P(4) = 0.35(4) + 7.6 = 9 \text{ million}$$

$$2020 \rightarrow t=8 \quad P(8) = 0.04(8)^2 - 0.6(8) + 11.6 = 9.36 \text{ million}$$

54. yes, vertical line only crosses function once

55. no, the area shaded has many x-values with multiple y-values (stacked points)

56. yes, passes vertical line test

57. no,  $x=0$  has two y-values

59.  $\{x \mid 1792 + 4n, n \in \mathbb{N}\}$  election in 1792, and then every 4 years.

Use whole numbers because  $1792 + 4(0) = 1792$

and negative numbers don't make sense.

$$81. x \neq -3, x \neq -1, x \neq 5$$

$\{x \mid x \neq -3, x \neq -1, x \neq 5, x \in \mathbb{R}\}$  ← easier for me.

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