

18 points possible

13. a. Since the graphs of f and g intersect at the points $(-9, 6)$ and $(3, 6)$, the solution set of $f(x) = g(x)$ is $\{-9, 3\}$. *1 pt*

- b. Since the graph of f is below the graph of g when x is between -9 and 3 , the solution set of $f(x) \leq g(x)$ is $\{x \mid -9 \leq x \leq 3\}$ or, using interval notation, $[-9, 3]$. *1 pt*

- c. Since the graph of f is above the graph of g to the left of $x = -9$ and to the right of $x = 3$, the solution set of $f(x) > g(x)$ is $\{x \mid x < -9 \text{ or } x > 3\}$ or, using interval notation, $(-\infty, -9) \cup (3, \infty)$. *1 pt*

33. $|x^2 - 9| = 0$ *Context: 2 pts*

$$x^2 - 9 = 0$$

$$x^2 = 9$$

$$x = \pm 3$$

The solution set is $\{-3, 3\}$.

35. $|x^2 - 2x| = 3$

$$x^2 - 2x = 3 \text{ or } x^2 - 2x = -3$$

$$x^2 - 2x - 3 = 0 \text{ or } x^2 - 2x + 3 = 0$$

$$(x-3)(x+1) = 0 \text{ or } x = \frac{2 \pm \sqrt{4-12}}{2}$$

$$= \frac{2 \pm \sqrt{-8}}{2} \text{ no real sol.}$$

$$x = 3 \text{ or } x = -1$$

The solution set is $\{-1, 3\}$. *2 pts*

#13 - Show graph's essentials - 1 pt

19. $|2x+3| = 5$

$$2x+3 = 5 \text{ or } 2x+3 = -5$$

$$2x = 2 \text{ or } 2x = -8$$

$$x = 1 \text{ or } x = -4$$

The solution set is $\{-4, 1\}$. *2 pts*

21. $|1-4t| + 8 = 13$

$$|1-4t| = 5$$

$$1-4t = 5 \text{ or } 1-4t = -5$$

$$-4t = 4 \text{ or } -4t = -6$$

$$t = -1 \text{ or } t = \frac{3}{2}$$

The solution set is $\{-1, \frac{3}{2}\}$.

is same as $|4t-1| + 8 = 13$

39. $|x| < 6$

$$-6 < x < 6$$

$$\{x \mid -6 < x < 6\} \text{ or } (-6, 6)$$



47. $|x-2| + 2 < 3$

$$|x-2| < 1$$

$$-1 < x-2 < 1$$

$$1 < x < 3$$

$$\{x \mid 1 < x < 3\} \text{ or } (1, 3)$$



29. $\left|\frac{x}{3} + \frac{2}{5}\right| = 2$

$$\frac{x}{3} + \frac{2}{5} = 2 \text{ or } \frac{x}{3} + \frac{2}{5} = -2$$

$$5x+6 = 30 \text{ or } 5x+6 = -30$$

$$5x = 24 \text{ or } 5x = -36$$

$$x = \frac{24}{5} \text{ or } x = -\frac{36}{5}$$

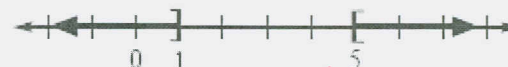
The solution set is $\left\{-\frac{36}{5}, \frac{24}{5}\right\}$. *2 pts*

51. $|x-3| \geq 2$

$$x-3 \leq -2 \text{ or } x-3 \geq 2$$

$$x \leq 1 \text{ or } x \geq 5$$

$$\{x \mid x \leq 1 \text{ or } x \geq 5\} \text{ or } (-\infty, 1] \cup [5, \infty)$$



2 pts

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#s 13, 19, 21, 29, 33, 35, 39, 47, 51, 57, 60

57. $|2x+1| < -1$

No solution since absolute value is always non-negative.



60. $|x - (-6)| < 3$

$|x+6| < 3$

$-3 < x+6 < 3$

$-9 < x < -3$

Solution set: $\{x | -9 < x < -3\}$ or $(-9, -3)$