

Unit 2 Comprehensive Review

Directions: No calculators are allowed. Show all work. Reduce all fractions. Box or circle all answers.

A. Distributive Property, Combining Like Terms

Problems 1-6: Simplify each expression.

1. $8x - 3x + 7$

2. $4a + 5b - 7a + 2b$

3. $3(2x - 5) + 4x$

4. $-2(y + 6) + 7y$

5. $4(3m - 2) - 2(m + 5)$

6. $-3(2p - 5) + 4(p + 1)$

7. Decide whether $4(x + 3) + 2x$ and $6x + 12$ are equivalent. If they are not, give one value of x that shows they are different.

8. Create an expression that uses distribution and simplifies to $9x - 4$.

B. Solving Linear Equations, Solving Linear Inequalities

Problems 9-14: Solve each equation. State no solution or infinitely many solutions when appropriate.

9. $3x + 5 = 26$

10. $4(a - 3) = 20$

11. $5m - 7 = 2m + 11$

12. $3(2y + 1) - 4y = 15$

13. $4n - 9 = 4n - 9$

14. $6p + 5 = 6p - 8$

Problems 15-19: Solve each inequality.

15. $2x - 5 \leq 13$

16. $-3a + 4 > 16$

17. $5m - 2 \leq 3m + 10$

18. $-2(r - 4) \geq 12$

19. $4p + 1 > 2p - 9$

Problems 20-24: Solve each compound inequality.

20. $-5 < 2x + 1 \leq 9$

21. $-12 \leq 3a < 6$

22. $1 < 4m - 3 \leq 13$

23. $-8 \leq -2y + 4 < 10$

24. $7 > 1 - 3n \geq -8$

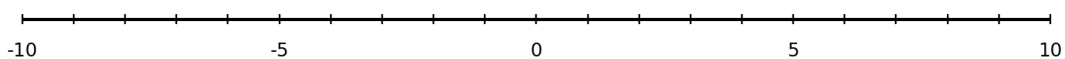
25. a. Create an equation with variables on both sides whose solution is $x = 3$.

b. Create an inequality that requires reversing the inequality symbol and has solution $x < 4$.

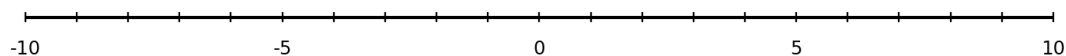
C. Graphing inequalities on a number line, Interval Notation

Problems 26-27: The inequality is already solved. Graph it on the number line and write it in interval notation.

26. $x \geq -4$ Interval notation:

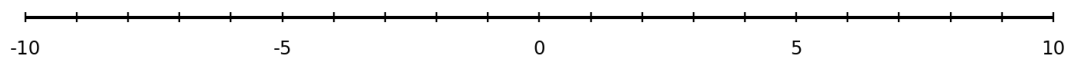


27. $-2 < x \leq 5$ Interval notation:

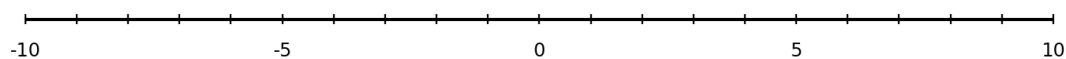


Problems 28-29: Interval notation is given. Write the solution in inequality form and graph it on the number line.

28. $(-\infty, 3)$ Inequality:

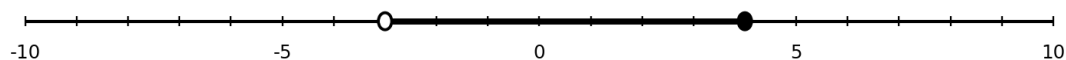


29. $[-2, 4)$ Inequality:



30. For each number-line graph, write the solution in inequality form and interval notation.

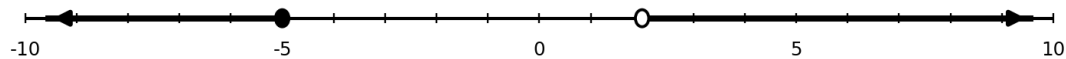
a.



Inequality: _____

Interval notation: _____

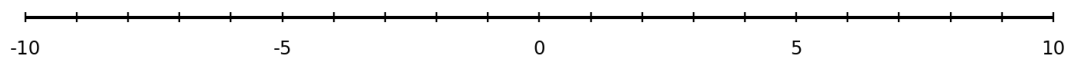
b.



Inequality: _____

Interval notation: _____

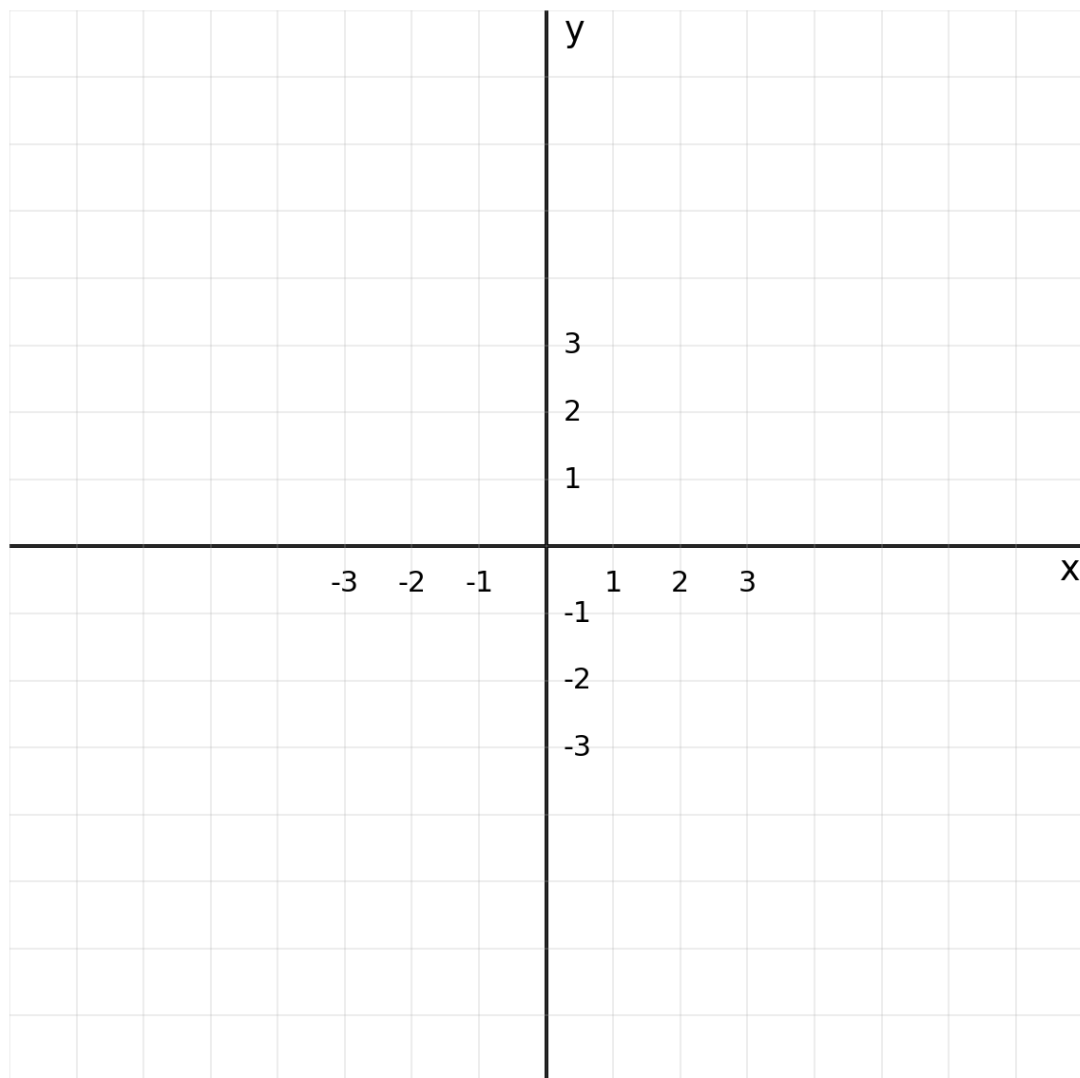
31. Solve $-2x + 4 \geq 14$. Then graph the solution and write it in interval notation.



32. Create a bounded solution set that contains 0 but does not contain 4. Give an inequality, interval notation, and a number-line graph for the same set.

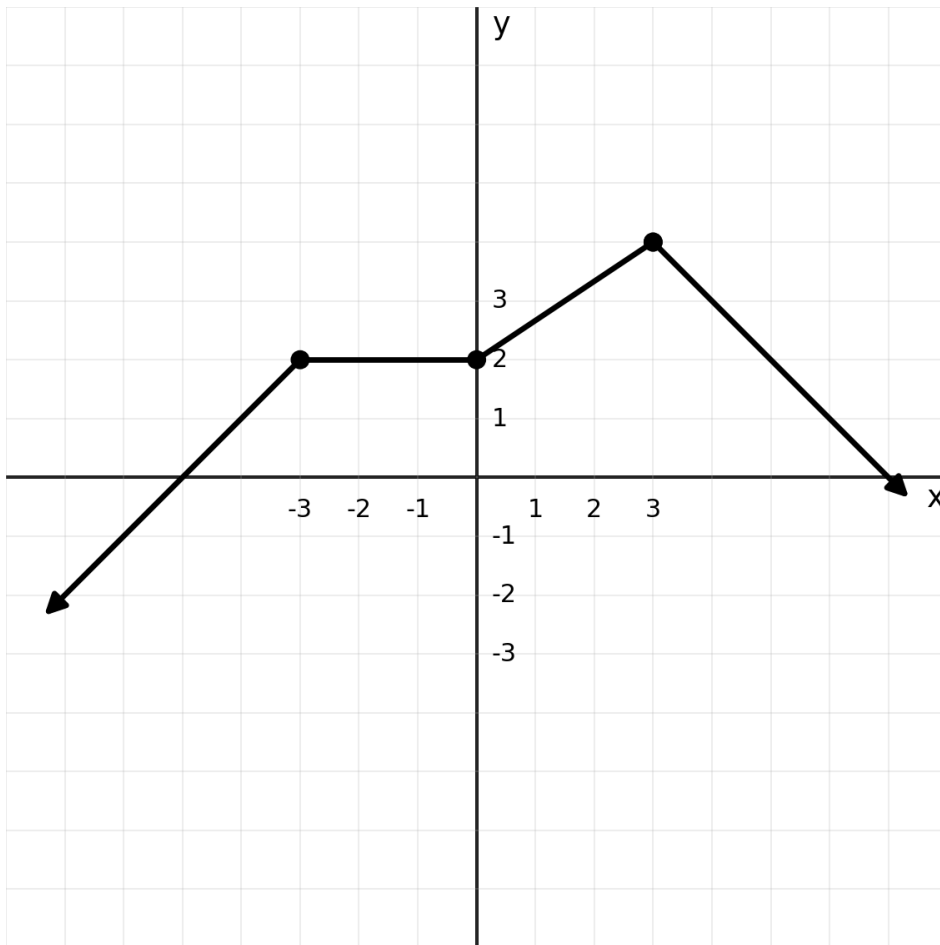
D. Basics of Coordinate System, Nine Key Features of a Function

33. Plot and label each point on the same coordinate plane: $A(-4,3)$, $B(2,-5)$, $C(0,4)$, $D(-6,0)$, $E(3,2)$, $F(-1,-3)$, $G(5,0)$, and $H(0,-2)$.



34. For each graph in parts a-b, state all nine key features: domain, range, increasing intervals, decreasing intervals, constant intervals, x-intercepts, y-intercept, absolute maximum value and where it occurs, and absolute minimum value and where it occurs. If a feature does not exist, write none.

a.



Domain: _____

Range: _____

Increasing: _____

Decreasing: _____

Constant: _____

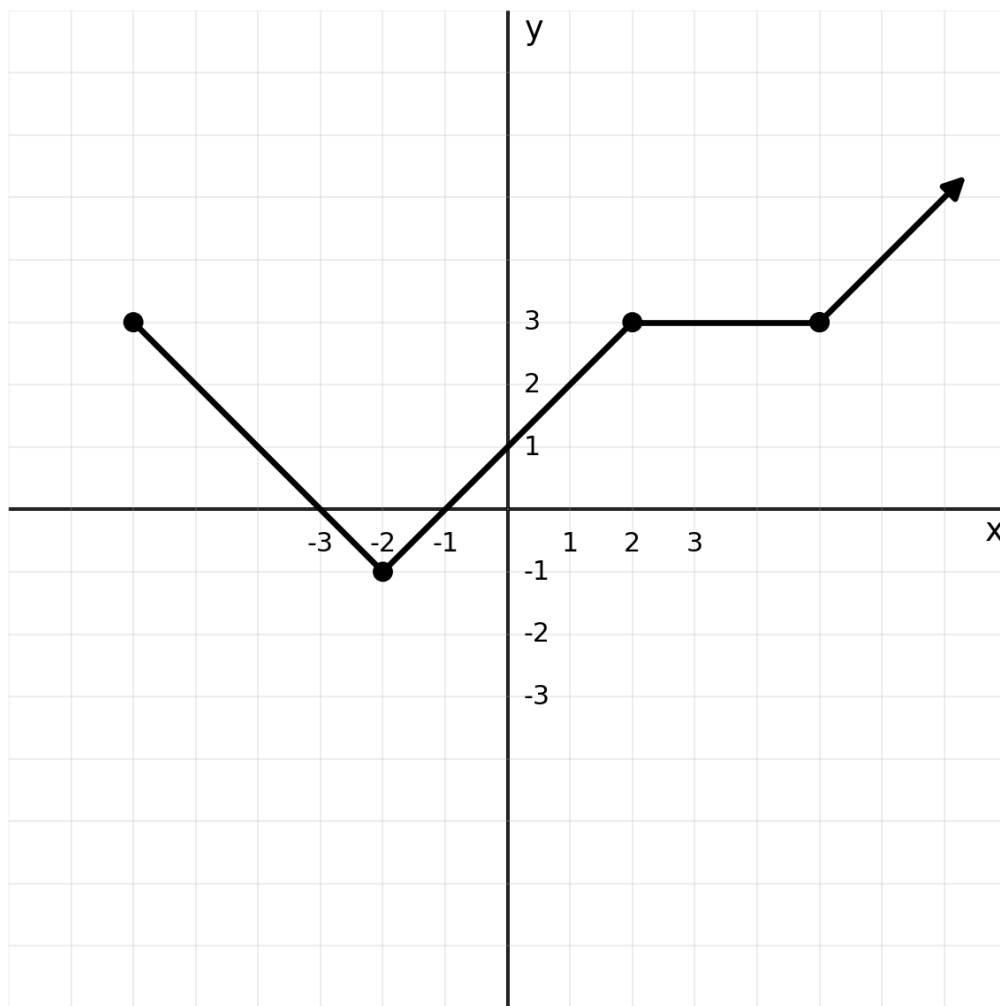
x-intercepts: _____

y-intercept: _____

Absolute maximum value and where it occurs: _____

Absolute minimum value and where it occurs: _____

b.



Domain: _____

Range: _____

Increasing: _____

Decreasing: _____

Constant: _____

x-intercepts: _____

y-intercept: _____

Absolute maximum value and where it occurs: _____

Absolute minimum value and where it occurs: _____

35. Create one function that satisfies all of the constraints below. More than one answer may be possible.

Domain: $\mathbb{R}$

Range: $(-\infty, 4]$

Increasing: $[-5, -2]$

Decreasing: $\mathbb{R}$

Constant: $[-2, 1]$

x-intercepts: two

y-intercept: one

Absolute maximum: 4

Absolute minimum: none

