PRACTICE SET 3: EXPRESSIONS, EQUATIONS, AND INEQUALITIES

1. Solve for x: $x + 7 = 15$.

A. 7

B. 8

C. 9

D. 10

2. Simplify: $4x + 3x - 2x$.

A. 3x

B. 4x

C. 6x

D. 5x

3. Solve: $3x = 21$.

A. 7

B. 8

C. 9

D. 10

4. Simplify: $2(x + 5)$.

A. $2x + 5$

B. $x + 10$

C. $2x + 10$

D. $2 + 10x$

5. Solve: $x - 4 = 9$.

A. 5

B. 11

C. 12

D. 13

6. Solve: $5x + 3 = 18$.

A. 3

B. 4

C. 5

D. 6

7. Simplify: $3(2x - 1) + 4$.

A. $6x + 4$

B. $6x - 3$

C. $6x + 1$

D. $6x - 1$

8. Solve for y: $2y - 7 = 5$.

A. 5

B. 6

C. 7

D. 8

9. Which expression represents "three more than twice a number"?

A. $2x + 3x$

B. $3x + 2$

C. $2(x + 3)$

D. $2x + 3$

10. Solve: $x/4 = 5$.

A. 20

B. 9

C. 1.25

D. 25

11. Simplify: $5x - 2x + 7 - 3$.

A. $3x + 10$

B. $7x - 10$

C. $3x - 4$

D. $3x + 4$

12. Solve: $2(x - 3) = 10$.

A. 8

B. 6

C. 4

D. 5

13. Solve the inequality: $x + 5 > 12$.

A. $x > 5$

B. $x > 6$

C. $x > 7$

D. $x > 8$

14. Simplify: $4(x + 2) - 3x$.

A. $x + 2$

B. $x + 8$

C. $7x + 8$

D. $x - 8$

15. Solve: $3x - 1 = 2x + 4$.

A. 5

B. 4

C. 3

D. 2

16. Which is equivalent to $6(x - 4)$?

A. $6x - 4$

B. $x - 24$

C. $6x + 24$

D. $6x - 24$

17. Solve: $4x = 28$.

A. 6

B. 7

C. 8

D. 9

18. Solve the inequality: $2x < 14$.

A. $x < 5$

B. $x < 6$

C. $x > 7$

D. $x < 7$

19. Simplify: $-2(x - 3)$.

A. $-2x - 3$

B. $-2x - 6$

C. $-2x + 6$

D. $2x - 6$

20. Solve: $x + 2x = 21$.

A. 7

B. 6

C. 5

D. 4

21. Which represents "5 less than a number"?

A. $x - 5$

B. $5 - x$

C. $x + 5$

D. $5x$

22. Solve: $3(x + 2) = 15$.

A. 1

B. 2

C. 3

D. 4

23. Simplify: $(2x + 5) - (x - 3)$.

A. $x - 8$

B. $3x + 8$

C. $3x + 2$

D. $x + 8$

24. Solve: $x/3 + 2 = 7$.

A. 10

B. 15

C. 20

D. 25

25. Solve the inequality: $3x + 6 \geq 15$.

A. $x \geq 3$

B. $x \geq 4$

C. $x \leq 3$

D. $x \geq 5$

26. Simplify: $7x - 2(x - 3)$.

A. $5x + 3$

B. $9x - 3$

C. $5x + 6$

D. $5x - 6$

27. Solve: $2x + 3 = x + 10$.

A. 3

B. 5

C. 6

D. 7

28. Which expression equals "the quotient of a number and 4"?

A. $4x$

B. $x/4$

C. $x + 4$

D. $x - 4$

29. Solve: $5(x - 2) = 25$.

A. 7

B. 6

C. 5

D. 4

30. Solve the inequality: $x - 3 < 10$.

A. $x < 7$

B. $x < 10$

C. $x < 12$

D. $x < 13$

31. Simplify: $6x + 2 - 4x + 5$.

A. $2x - 7$

B. $10x + 7$

C. $2x + 7$

D. $2x + 3$

32. Solve: $4x - 3 = 2x + 7$.

A. 5

B. 4

C. 3

D. 2

33. Solve: $2x + 3(x - 1) = 12$.

A. 1

B. 2

C. 2.5

D. 3

34. Solve the inequality: $-x > -5$.

A. $x > 5$

B. $x < 5$

C. $x < -5$

D. $x > -5$

35. Simplify: $3(x + 2) + 2(x - 4)$.

A. $5x + 4$

B. $5x + 14$

C. $5x - 2$

D. $5x + 2$

36. Solve: $7x = 42$.

A. 5

B. 7

C. 8

D. 6

37. Solve: $x - 2(x - 3) = 4$.

A. 2

B. 3

C. 4

D. 5

38. Solve the inequality: $2x - 5 \geq 3$.

A. $x \geq 2$

B. $x \geq 3$

C. $x \geq 4$

D. $x \leq 4$

39. Simplify: $5x - (3x - 2)$.

A. $8x + 2$

B. $2x + 2$

C. $2x - 2$

D. $8x - 2$

40. Solve: $3x - 4 = 2(x + 1)$.

A. 2

B. 4

C. 5

D. 6

41. Which is equivalent to $3(x - 2) + 5$?

A. $3x + 5$

B. $3x - 1$

C. $3x - 11$

D. $3x + 1$

42. Solve: $|x| = 6$.

A. $x = 6$ only

B. $x = -6$ only

C. $x = 0$

D. $x = 6$ or $x = -6$

43. Solve: $5(x + 1) - 2x = 11$.

A. 2

B. 3

C. 4

D. 5

44. Simplify: $2x + 3(x - 2)$.

A. $5x - 2$

B. $5x - 4$

C. $5x - 6$

D. $5x + 6$

45. Solve the inequality: $4x + 2 > 10$.

A. $x > 1$

B. $x < 2$

C. $x > 3$

D. $x > 2$

46. Solve: $2(x - 1) + 3 = 7$.

A. 1

B. 3

C. 4

D. 5

47. Which expression represents "7 more than half a number"?

A. $x/2 + 7$

B. $7x + 2$

C. $2x + 7$

D. $x + 7/2$

48. Solve: $3x + 5 = 26$.

A. 5

B. 6

C. 8

D. 7

49. Solve the inequality: $6x - 3 < 15$.

A. $x < 2$

B. $x < 4$

C. $x < 3$

D. $x > 3$

50. Solve: $8 - 2x = 2$.

A. 5

B. 3

C. 4

D. 1

PRACTICE SET 3: ANSWER KEY AND EXPLANATIONS

1. B — 8. Subtracting 7 from both sides gives $x = 15 - 7 = 8$. Basic linear equations are solved by isolating the variable through inverse operations.
2. D — 5x. Combining like terms, $4x + 3x - 2x = (4 + 3 - 2)x = 5x$. Like terms combine by adding or subtracting their coefficients while preserving the variable.
3. A — 7. Dividing both sides by 3 gives $x = 21 \div 3 = 7$. Multiplication equations are reversed by division.
4. C — 2x + 10. Distributing the 2 across both terms inside the parentheses gives $2x + 2(5) = 2x + 10$. The distributive property applies the multiplier to every term.
5. D — 13. Adding 4 to both sides gives $x = 9 + 4 = 13$. Addition and subtraction are inverse operations in linear equations.
6. A — 3. Subtracting 3 from both sides gives $5x = 15$, and dividing by 5 gives $x = 3$. Two-step equations reverse operations in opposite order.
7. C — 6x + 1. Distributing gives $6x - 3 + 4$, and combining constants produces $6x + 1$. Simplification always combines the distribution result with any remaining terms.
8. B — 6. Adding 7 to both sides gives $2y = 12$, then dividing by 2 gives $y = 6$. Standard two-step solving procedure applies.
9. D — 2x + 3. "Twice a number" translates to 2x, and "three more than" means adding 3. The result is $2x + 3$.
10. A — 20. Multiplying both sides by 4 gives $x = 20$. Division equations are reversed through multiplication.
11. D — 3x + 4. Combining like terms: $5x - 2x = 3x$ and $7 - 3 = 4$. The simplified expression is $3x + 4$.
12. A — 8. Distributing gives $2x - 6 = 10$, then adding 6 gives $2x = 16$, so $x = 8$. Parentheses are handled through distribution first.
13. C — $x > 7$. Subtracting 5 from both sides gives $x > 7$. Inequalities follow the same operations as equations, with sign-flip rules for negatives.
14. B — x + 8. Distributing gives $4x + 8 - 3x$, and combining like terms produces $x + 8$.

15. A — 5. Subtracting 2x gives $x - 1 = 4$, then adding 1 gives $x = 5$. Variables on both sides are collected before isolating.

16. D — $6x - 24$. Distributing 6 across $(x - 4)$ gives $6x - 24$. Negative constants inside parentheses produce negative results when multiplied by a positive factor.

17. B — 7. Dividing both sides by 4 gives $x = 28 \div 4 = 7$.

18. D — $x < 7$. Dividing both sides by 2 gives $x < 7$. Positive-number division does not flip the inequality.

19. C — $-2x + 6$. Distributing -2 gives $-2x + 6$. A negative times a negative produces a positive in the second term.

20. A — 7. Combining gives $3x = 21$, and dividing by 3 gives $x = 7$.

21. A — $x - 5$. "Less than" reverses the expected order, so "5 less than a number" is $x - 5$, not $5 - x$.

22. C — 3. Distributing gives $3x + 6 = 15$, then subtracting 6 gives $3x = 9$, so $x = 3$.

23. D — $x + 8$. Distributing the minus sign gives $2x + 5 - x + 3$, and combining produces $x + 8$. Always distribute negatives across every term.

24. B — 15. Subtracting 2 gives $x/3 = 5$, then multiplying both sides by 3 gives $x = 15$.

25. A — $x \geq 3$. Subtracting 6 gives $3x \geq 9$, then dividing by 3 gives $x \geq 3$.

26. C — $5x + 6$. Distributing -2 gives $7x - 2x + 6$, and combining produces $5x + 6$.

27. D — 7. Subtracting x from both sides gives $x + 3 = 10$, then subtracting 3 gives $x = 7$.

28. B — $x/4$. "Quotient" means division, and "of a number and 4" places the number over 4 as $x/4$.

29. A — 7. Distributing gives $5x - 10 = 25$, then adding 10 gives $5x = 35$, so $x = 7$.

30. D — $x < 13$. Adding 3 to both sides gives $x < 13$ directly.

31. C — $2x + 7$. Combining: $6x - 4x = 2x$ and $2 + 5 = 7$, giving $2x + 7$.

32. A — 5. Subtracting $2x$ gives $2x - 3 = 7$, then adding 3 gives $2x = 10$, so $x = 5$.

33. D — 3. Distributing gives $2x + 3x - 3 = 12$, combining gives $5x - 3 = 12$, then $5x = 15$, so $x = 3$.

34. B — $x < 5$. Dividing by -1 flips the inequality: $x < 5$. Multiplying or dividing by a negative always reverses the inequality direction.

35. C — $5x - 2$. Distributing gives $3x + 6 + 2x - 8$, and combining produces $5x - 2$.

36. D — 6. Dividing both sides by 7 gives $x = 42 \div 7 = 6$.

37. A — 2. Distributing -2 gives $x - 2x + 6 = 4$, combining to $-x + 6 = 4$, then $x = 2$ after isolating.

38. C — $x \geq 4$. Adding 5 gives $2x \geq 8$, then dividing by 2 gives $x \geq 4$.

39. B — $2x + 2$. Distributing the minus gives $5x - 3x + 2$, and combining produces $2x + 2$.

40. D — 6. Distributing gives $3x - 4 = 2x + 2$, then subtracting $2x$ gives $x - 4 = 2$, so $x = 6$.

41. B — $3x - 1$. Distributing gives $3x - 6 + 5 = 3x - 1$.

42. D — $x = 6$ or $x = -6$. Absolute value equations produce two solutions representing equal distances from zero on either side.

43. A — 2. Distributing gives $5x + 5 - 2x = 11$, combining to $3x + 5 = 11$, then $3x = 6$, so $x = 2$.

44. C — $5x - 6$. Distributing gives $2x + 3x - 6$, and combining produces $5x - 6$.

45. D — $x > 2$. Subtracting 2 gives $4x > 8$, then dividing by 4 gives $x > 2$.

46. B — 3. Distributing gives $2x - 2 + 3 = 7$, simplifying to $2x + 1 = 7$, then $2x = 6$, so $x = 3$.

47. A — $x/2 + 7$. "Half a number" is $x/2$, and "7 more than" means adding 7 to give $x/2 + 7$.

48. D — 7. Subtracting 5 gives $3x = 21$, then dividing by 3 gives $x = 7$.

49. C — $x < 3$. Adding 3 gives $6x < 18$, then dividing by 6 gives $x < 3$.

50. B — 3. Subtracting 8 gives $-2x = -6$, then dividing by -2 gives $x = 3$. The negative divides out cleanly without flipping any inequality (this is an equation, not an inequality).