Intro Algebra Challenge

Use this key to check answers and read the explanations.

1. What is 3x + 2 when x = 4?
   - A. 14
   - B. 9
   - C. 12
   - D. 18

   Correct answer: A. 14
   Three times four is 12. Add 2 to get 14.

2. Which expression simplifies to 9m?
   - A. 9 + m
   - B. 4m + 5
   - C. 4m + 5m
   - D. 5m − 4m

   Correct answer: C. 4m + 5m
   The coefficients of the two like terms add to 9, and the variable stays m.

3. Which expression means ‘seven less than twice a number n’?
   - A. 7 − 2n
   - B. 2n − 7
   - C. 2(n − 7)
   - D. 2n + 7

   Correct answer: B. 2n − 7
   Twice the number is 2n. Subtract seven from that result.

4. Solve x + 11 = 26.
   - A. 37
   - B. 13
   - C. 16
   - D. 15

   Correct answer: D. 15
   Subtract 11 from both sides to isolate x.

5. Solve 7y = 63.

A. 7
B. 9
C. 8
D. 56

Correct answer: B. 9
Divide both sides by 7 to find y = 9.

6. Solve 4a − 9 = 19.

A. 7
B. 2.5
C. 5
D. 10

Correct answer: A. 7
Add 9 to get 4a = 28, then divide by 4.

7. Which expression is equivalent to 3(2b − 5) + b?

A. 3b − 14
B. 7b − 5
C. 6b − 15
D. 7b − 15

Correct answer: D. 7b − 15
Distribute the 3 to get 6b − 15, then add the remaining b.

8. Solve 5x + 1 = 2x + 19.

A. 7
B. 4
C. 6
D. 10

Correct answer: C. 6
Subtract 2x from both sides and then subtract 1. That gives 3x = 18, so x = 6.

9. Solve (t + 6)/4 = 5.

A. 14
B. 10
C. 20
D. 26

Correct answer: A. 14
Multiply both sides by 4 to get t + 6 = 20. Subtract 6 to find t = 14.

10. What value solves 2(p − 4) = 3(p − 7)?

A. 29
B. 8
C. 11
D. 13

Correct answer: D. 13
Expanding gives 2p − 8 = 3p − 21. Subtract 2p and add 21 to find p = 13.

11. A taxi charges a $5 pickup fee and $3 per mile. What trip length gives a $32 charge before tip?

A. 8 miles
B. 7 miles
C. 9 miles
D. 11 miles

Correct answer: C. 9 miles
Subtract the $5 fixed fee. The remaining $27 pays for 9 miles at $3 each.

12. Which equation has no real solution?

A. 3(x + 2) = 3x + 6
B. 3(x + 2) = 3x + 8
C. 3(x + 2) = 2x + 8
D. 3(x + 2) = 4x + 8

Correct answer: B. 3(x + 2) = 3x + 8
The equation 3(x + 2) = 3x + 8 reduces to 6 = 8 after expanding and subtracting 3x. No value can make that statement true.

13. The sum of three consecutive whole numbers is 105. What is the largest?

A. 37
B. 34
C. 35
D. 36

Correct answer: D. 36
The middle number is the mean of the three, 105 ÷ 3 = 35. The next whole number is 36.

14. A two-hour pass costs $9 plus $4 for each extra hour. An all-day pass costs $29. For how many total hours do both options cost the same?

A. 7 hours
B. 5 hours
C. 6 hours
D. 8 hours

Correct answer: A. 7 hours
The $20 difference pays for five extra hours. Add the two included hours to get seven.

15. A school sells 36 tickets. Adult tickets cost $8 and student tickets cost $5. The school collects $228. How many adult tickets were sold?

A. 18
B. 12
C. 16
D. 20

Correct answer: C. 16
If every ticket were a student ticket, revenue would be $180. The actual total is $48 higher. Each adult ticket adds $3, so there were 16.