Equations Practice Problems

Solving an Equation for a Variable

1) Name the inverse operation needed to solve for the variable.

   a. x + 9 = 17

   b. y – 8 = 5

   c. m + 5 = 21

   d. $\dfrac{w}{6} = 12$

   e. 9v = 108

2) Whose method of solving the equation is better? Explain your answer.

   Michael

   $x + 18 = 29$
   $\underline{-18 \;\; -18}$
   $x = 11$

   Amanda

   $x + 18 = 29$
   $\underline{-29 \;\; -29}$
   $x - 11 = 0$
   $\underline{+11 \; +11}$
   $x = 11$

3) Name the step needed to solve for the variable.

   a. t – 18 = 54

   b. 14x = 228

   c. m + 19 = 51

   d. 11b = 66

   e. $\dfrac{m}{4} = 2$

One Step Equations

4) Solve.
   a.   n + 7 = 20
   b.   x + 9 = -8
   c.   a – 15 = 27
   d.   y – 21 = -15
   e.   50 + w = 92

f.   -4 + m = 18

g. $\dfrac{m}{8} = 16$

h.   30 = 12m

i.   -5m = 25

j. $\dfrac{t}{6} = 12$

k.   -10c = -80

l.   n – (-6)= 12

m. -82 + x = -20

n. $\dfrac{-r}{2} = 5$

o.   r – 3.4 = 7.1

Two Step Equations: Remember to Undo Addition or Subtraction 1ˢᵗ! Then perform inverse operation of multiplication or division to Both sides to Solve the Equation.

Ex.   3x – 5 = -14

          +5   +5   (adding 5 is the inverse of subtracting 5)

          3x   = -9   (divide by 3 now since x is being multiplied by 3)

          3   **3**

          x = -3

5)   7x – 2 = 26
6)   2m – 6 = 48
7)   -6h – 6 = 30
8)   5x + 20 = -20
9)   3 = -3y – 15
10) -24 = 14y – 5
11) 7r – 5 = 10
12) 9 = 16y + 51
13) 13x + 6 = 6

14) $\dfrac{x}{-4} + 11 = 5$

15) -4.5x + 12.3 = -23.7

16) $\dfrac{x}{5} + 4 = 4.3$

17) $-\dfrac{x}{3} + \left(-7.2\right) = -2.1$

18) 5.4x – 8.3 = 14.38

19) $\dfrac{x}{3} - 14 = -8$

Multi-Step Equations

Always Distribute if there are Parenthesis. Then, Combine Like Terms if possible before solving the remaining 2-step Equation!

Example of Distributive Property: 2(m – 4) = 2(m) + 2(-4) = 2m – 8

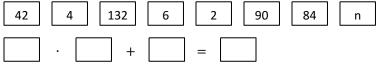Notice both terms in ( ) are multiplied by 2!

Solve.

20) $3(x + 9) = 60$

21) $2(m - 8) = 12$

22) 35 = 22x – 12x + 5

23) 6(b + 8) = 54

24) 99 = 33x + 3(3x + 5)

25) –t + 5t – 7 = -5

Writing and Solving Algebraic Equations

26) Luna is going bowling. Shoe rental cost $3 and the lane cost $2 per game. If Luna paid a total of $17, how many games did she bowl?

27) Audra and Tina are shopping at the Tanger Outlets. There is no additional sales tax for the weekend they are shopping.
Part A
At the GUESS Factory Store, Audra purchased 2 pairs of jeans that cost $42 each and 4 shirts. The cost of Audra's total purchase was $132. Write an equation that can be used to find n, the number of shirts that Audra purchased. Drag and drop the appropriate variable or number into each box.

| 42 | 4 | 132 | 6 | 2 | 90 | 84 | n |

☐ · ☐ + ☐ = ☐

Part B
At the Banana Republic Store, Tina buys 3 T-shirts and 2 skirts. Each T-shirt costs $22.50. Tina pays the clerk $200 and gets $24.50 in change. What is the cost, in dollars, of one skirt?

28) Jose went to an all-you-can-eat buffet. He paid $15 for his meal and $2 for each soda. If Jose spent $21, how many sodas did he buy?

Answer Key

1.
   a. Subtraction
   b. Addition
   c. Subtraction
   d. Multiplication
   e. Division
2. Michael's method is better because he moved the number/constant that was on the same side as the variable to get the variable by itself.
3.
   a. Add 18 to both sides
   b. Divide both sides by 14
   c. Subtract 19 from both sides
   d. Divide both sides by 11
   e. Multiply both sides by 4

4.
   a. 13
   b. -17
   c. 42
   d. 6
   e. 42
   f. 22
   g. 128
   h. 2 ½
   i. -5
   j. 72
   k. 8
   l. 6
   m. 62
   n. -10
   o. 10.5

5. 4
6. 27
7. -6
8. -8
9. -6
10. -19/14
11. 15/7
12. -21/8
13. 0
14. 24
15. 8
16. 1.5
17. -15.3
18. 4.2
19. 18
20. 11
21. 14
22. 3
23. 1

24. 2
25. ½

26. 7 games
27. **Part A**
   $4 \cdot n + 84 = 132$
   Part B
   Each skirt cost $59.00
28. 3 sodas