

# [1.3] Solving Equations w/ Variables on Both Sides

$$\begin{array}{r|l} \textcircled{1} & 20 + 7x = 9x \\ & \underline{-7x \quad -7x} \\ & 20 = 2x \\ & \underline{\quad \quad \quad} \\ & x = 10 \end{array}$$

Pink is optional

Variable First

$$\begin{array}{r|l} \textcircled{2} & -1(5a + 6) = 2(3a + 8) \\ & -5a + -6 = 6a + 16 \\ & \underline{-6a \quad -6a} \\ & -11a + -6 = 16 \\ & \underline{\quad \quad \quad} \\ & -11a = 22 \\ & \underline{-11 \quad -11} \\ & a = -2 \end{array}$$

Line up Like terms

$$\begin{array}{r|l} \textcircled{3} & 5(x + 2) = 5x + 12 + 2 \\ & 5x + -10 = 5x + -10 \\ & \underline{-5x \quad -5x} \\ & -10 = -10 \end{array}$$

$$\begin{array}{r|l} \textcircled{4} & 2x = 6 + 5x - 3 \\ & 2x = 6 + 2x \\ & \underline{-2x \quad -2x} \\ & 0 \neq 6 \end{array}$$

IF you get a true statement, than any real # works!

IF you get a False statement, then there's No Solution.

In Finite ly Many Solutions  
(identity) **IMS**

**NS**



$$\begin{array}{r} \textcircled{5} \quad 6x - 2 = 5x + 8 \\ \quad \underline{-5x} \quad \quad \underline{-5x} \\ \quad x - 2 = 8 \\ \quad \quad \boxed{x = 10} \end{array}$$

$$\begin{array}{r} \textcircled{6} \quad 6x + 4 = 2(-3x + 2) \\ \quad 6x + 4 = -6x + 4 \\ \quad \underline{+6x} \quad \quad \underline{+6x} \\ \quad 12x + 4 = 4 \\ \quad \quad \quad \underline{12x} = \underline{0} \\ \quad \quad \quad \quad \underline{12} \quad \quad \underline{12} \\ \quad \quad \quad \quad \quad \quad \boxed{x = 0} \end{array}$$

Textbook p 22 (#16-40) x 2



## PRACTICE

Solve each equation. SEE EXAMPLES 1-3

16.  $5x - 4 = 4x$

17.  $7x = 8x + 12$

18.  $27 - 3x = 3x + 27$

19.  $34 - 2x = 7x$

20.  $5r - 7 = 2r + 14$

21.  $-x = 7x - 56$

22.  $5(n - 7) = 2(n + 14)$

23.  $6w - 33 = 3(4w - 5)$

24.  $3(x - 2) = 9x$

25.  $6(x + 5) = 3x$

26.  $\frac{4x + 6}{2} = \frac{3x - 15}{3}$

27.  $\frac{q + 1}{2} = \frac{q - 1}{3}$

28.  $2c + 3 = 2c + 3$

29.  $12b + 9 = 12b + 11$

30.  $x - 27 = -(27 - x)$

31.  $4(x + 9) = x + 9$

32.  $16(4 - 3m) = 96\left(-\frac{m}{2} + 1\right)$

33.  $6y - 8 = 2(3y - 4)$

34.  $5(5t + 1) = 25t - 7$

35.  $-3k + 4 = -2 - 6k$

36.  $\frac{1}{4}(2(x - 1) + 10) = x$

37.  $\frac{6x + 8}{2} - 4 = 3x$

38.  $3y = \frac{8 - 12y}{4} + 2$

39.  $0.25t = 0.25 - t$

40.  $0.625(x + 10) - 10 = 0$

Solve each problem. SEE EXAMPLE 4

41. Tavon has a \$50 gift card that loses \$2 for each 30-day period it is not used. He has a \$40 card that loses \$1.50 for each 30-day period it is not used.

- Write and solve an equation for the number of 30-day periods until the value of the gift cards will be equal.
- What will the value of each card be when they have equal value?

42. A cereal box manufacturer changes the size of the box to increase the amount of cereal it contains. The equations  $12 + 7.6n$  and  $6 + 8n$ , where  $n$  is the number of smaller boxes, are both representative of the amount of cereal that the new larger box contains. How many smaller boxes equal the same amount of cereal in the larger box?

