

CHAPTER 6 - EQUATIONS AND INEQUALITIES

6.1 SOLVING TYPE I EQUATIONS

When solving Type I equations algebraically, we use the opposite operation that is displayed to determine what value our **variable** (letter) has. Addition is the opposite operation of subtraction, and multiplication is the opposite operation of division. There are 4 kinds of Type I equations that we will be solving and the examples below show how each type is solved.

TYPE 1 (ADDITION)

$$\begin{aligned} x + 6 &= 8 \\ x &= 8 - 6 \\ x &= 2 \end{aligned}$$

TYPE 1 (SUBTRACTION)

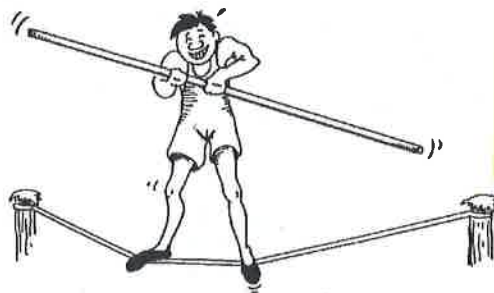
$$\begin{aligned} x - 8 &= 4 \\ x &= 4 + 8 \\ x &= 12 \end{aligned}$$

TYPE 1 (MULTIPLICATION)

$$\begin{aligned} 5x &= -35 \\ \frac{5x}{5} &= \frac{-35}{5} \\ x &= -7 \end{aligned}$$

TYPE 1 (DIVISION)

$$\begin{aligned} \frac{x}{3} &= -8 \\ \frac{x}{3} &= \frac{-8}{1} \\ x &= -24 \end{aligned}$$



(Note that in each case above we removed the number beside the letter by using the opposite operation. But when we have a division type question we do a special type of opposite operation called **cross-multiplication**.)

A. Solve the following showing all steps.

$$\begin{aligned} 1. \quad x + 6 &= 12 \\ &\quad -6 \end{aligned}$$

$$\begin{aligned} 2. \quad x - 7 &= 8 \\ &\quad +15 \end{aligned}$$

$$\begin{aligned} 3. \quad \frac{x}{6} &= 9 \\ &\quad \cdot 6 \end{aligned}$$

$$\begin{aligned} 4. \quad 5x &= 30 \\ &\quad \div 5 \end{aligned}$$

$$\begin{aligned} 5. \quad x + 10 &= 4 \\ &\quad -10 \end{aligned}$$

$$\begin{aligned} 6. \quad \frac{x}{3} &= -6 \\ &\quad \cdot 3 \end{aligned}$$

$$\begin{aligned} 7. \quad -5x &= 20 \\ &\quad \div -5 \end{aligned}$$

$$\begin{aligned} 8. \quad \frac{5}{8}x &= -9 \\ &\quad \cdot \frac{8}{5} \end{aligned}$$

$$\begin{aligned} 9. \quad 4 + x &= 13 \\ &\quad -4 \end{aligned}$$

$$\begin{aligned} 10. \quad x - 8 &= -30 \\ &\quad +22 \end{aligned}$$

$$\begin{aligned} 11. \quad \frac{x}{-3} &= -3 \\ &\quad \cdot -3 \end{aligned}$$

$$\begin{aligned} 12. \quad 14x &= -3 \\ &\quad \div 14 \end{aligned}$$

$$\begin{aligned} 13. \quad 5x &= -76 \\ &\quad \div 5 \end{aligned}$$

$$\begin{aligned} 14. \quad 7x &= \frac{-3}{4} \\ &\quad \cdot \frac{4}{7} \end{aligned}$$

$$\begin{aligned} 15. \quad -7 + x &= 13 \\ &\quad +7 \end{aligned}$$

$$\begin{aligned} 16. \quad x + \frac{1}{2} &= \frac{3}{4} \\ &\quad -\frac{1}{2} \end{aligned}$$

$$\begin{aligned} 17. \quad -9x &= -16 \\ &\quad \div -9 \end{aligned}$$

$$\begin{aligned} 18. \quad \frac{-3}{4}x &= 12 \\ &\quad \cdot \frac{4}{-3} \end{aligned}$$

$$\begin{aligned} 19. \quad \frac{x}{0.3} &= -0.8 \\ &\quad \cdot 0.3 \end{aligned}$$

$$\begin{aligned} 20. \quad x + 1.6 &= -0.07 \\ &\quad -1.6 \end{aligned}$$

$$\begin{aligned} 21. \quad x + 6.3 &= -14 \\ &\quad -6.3 \end{aligned}$$

$$\begin{aligned} 22. \quad \frac{4}{3}x &= 7 \\ &\quad \cdot \frac{3}{4} \end{aligned}$$

$$\begin{aligned} 23. \quad 0.01x &= -0.01 \\ &\quad \div 0.01 \end{aligned}$$

$$\begin{aligned} 24. \quad \frac{x}{1.2} &= 5.3 \\ &\quad \cdot 1.2 \end{aligned}$$

$$\begin{aligned} 25. \quad x - 10 &= 0.003 \\ &\quad +10 \end{aligned}$$

$$\begin{aligned} 26. \quad \frac{7}{3}x &= \frac{3}{4} \\ &\quad \cdot \frac{3}{7} \end{aligned}$$

$$\begin{aligned} 27. \quad x - 9 &= -30 \\ &\quad +9 \end{aligned}$$

$$\begin{aligned} 28. \quad x + 9 &= -1.6 \\ &\quad -9 \end{aligned}$$