

Solving 2-Step Equations (with Groups)

AB-TSE 3

Instructions: Solve each equation.

1 $\frac{3(x - 5)}{3} = \frac{18}{3}$

$$\begin{array}{r} x - 5 = 6 \\ +5 \quad +5 \end{array}$$

$x = 11$

2 $5(x + 6) = 40$

3 $\frac{x + 9}{2} = 5$

4 $\frac{x - 15}{4} = 3$

5 $32 = 8(x + 1)$

6 $\frac{3 + x}{7} = 4$

7 $\frac{x - 10}{9} = 7$

8 $6(x - 11) = 42$

9 $10(x + 2) = 70$

10 $\frac{x + 5}{4} = 14$

Solving "Tricky" 2-Step Equations

AB-TSE 4

Instructions: Some 2-Step Equations are tricky because of the location of the unknown in operations that don't commute (subtraction and division). One way to solve these equations is to do an extra initial step to re-arrange the equation so that it looks like one you already know how to solve.

$$1 \quad (\cancel{x+5}) \frac{12}{\cancel{x+5}} = 2(x+5)$$

$$\frac{12}{2} = \frac{\cancel{2}(x+5)}{\cancel{2}}$$

$$\begin{array}{r} 6 = x + 5 \\ -5 \quad -5 \end{array}$$

$$1 = x \quad \text{or} \quad x = 1$$

$$2 \quad \frac{21}{x-4} = 7$$

$$3 \quad 11 = 23 - 4x$$

$$4 \quad 27 - 3x = 15$$

$$5 \quad 8 = \frac{24}{x-3}$$

$$6 \quad 7 = \frac{77}{x+6}$$

$$7 \quad 41 - 2x = 9$$

$$8 \quad 25 = 80 - 11x$$

Solving 2-Step Equations (with decimals)

AB-TSE 5

Instructions: Solve each equation. You can use a calculator to do the decimal arithmetic if you'd like to.

1 $1.5 + 2x = 12.5$

2 $3.5(x + 0.2) = 7$

3 $\frac{x + 6.1}{2} = 3.4$

4 $\frac{x - 3}{2.8} = 1.2$

5 $4(x - 1.9) = 5.2$

6 $\frac{x}{1.1} + 3.6 = 4.3$

7 $\frac{x - 2.5}{9} = 4.5$

8 $3x + 1.8 = 7.2$

9 $\frac{x}{0.4} - 2.3 = 7.2$

10 $\frac{x + 1.7}{3.1} = 6$

Solving 2-Step Equations (with negative numbers)

AB-TSE 6

Instructions: Solve each equation.

1 $-5 + 2x = -17$

2 $-9(x - 9) = 27$

3 $\frac{x + (-3)}{-5} = -6$

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

5 $3(x - 8) = -60$

6 $\frac{x}{-2} + 10 = -3$

7 $\frac{x + 8}{-6} = 2$

8 $-3x - 3 = -15$

9 $\frac{x}{-9} - 1 = 9$

10 $\frac{x - 12}{-7} = 4$

Solving 2-Step Equations

1 Solve for x
 $2x + 5 = 17$

2 Solve for x
 $\frac{x}{3} - 6 = 4$

3 Solve for x
 $20 = 8 + 4x$

4 Solve for x
 $2(x + 9) = 24$

5 Solve for x
 $15 = 3(x - 6)$

6 Solve for x
 $\frac{x + 3}{5} = 4$

7 Solve for x
 $5 = 9 - 2x$

8 Solve for x
 $\frac{28}{x - 2} = 4$

Solving 2-Step Equations (with Groups)

AB-TSE 3

Instructions: Solve each equation.

$$1 \quad \frac{3(x-5)}{3} = \frac{18}{3}$$

$$x - 5 = 6$$

$$+5 \quad +5$$

$$x = 11$$

$$2 \quad \frac{5(x+6)}{5} = \frac{40}{5}$$

$$x + 6 = 8$$

$$-6 \quad -6$$

$$x = 2$$

$$3 \quad \frac{x+9}{2} = 5(2)$$

$$x + 9 = 10$$

$$-9 \quad -9$$

$$x = 1$$

$$4 \quad \frac{x-15}{4} = 3(4)$$

$$x - 15 = 12$$

$$+15 \quad +15$$

$$x = 27$$

$$5 \quad \frac{32}{8} = \frac{8(x+1)}{8}$$

$$4 = x + 1$$

$$-1 \quad -1$$

$$3 = x \quad \text{or} \quad x = 3$$

$$6 \quad \frac{3+x}{7} = 4(7)$$

$$3 + x = 28$$

$$-3 \quad -3$$

$$x = 25$$

$$7 \quad \frac{x-10}{9} = 7(9)$$

$$x - 10 = 63$$

$$+10 \quad +10$$

$$x = 73$$

$$8 \quad \frac{6(x-11)}{6} = \frac{42}{6}$$

$$x - 11 = 7$$

$$+11 \quad +11$$

$$x = 18$$

$$9 \quad \frac{10(x+2)}{10} = \frac{70}{10}$$

$$x + 2 = 7$$

$$-2 \quad -2$$

$$x = 5$$

$$10 \quad \frac{x+5}{4} = 14(4)$$

$$x + 5 = 56$$

$$-5 \quad -5$$

$$x = 51$$

Solving "Tricky" 2-Step Equations

AB-TSE 4

Instructions: Some 2-Step Equations are tricky because of the location of the unknown in operations that don't commute (subtraction and division). One way to solve these equations is to do an extra initial step to re-arrange the equation so that it looks like one you already know how to solve.

$$1 \quad (\cancel{x+5}) \frac{12}{\cancel{x+5}} = 2(x+5)$$

$$\frac{12}{2} = \frac{2(x+5)}{2}$$

$$6 = x + 5$$

$$-5 \quad -5$$

$$1 = x \quad \text{or} \quad x = 1$$

$$2 \quad (\cancel{x-4}) \frac{21}{\cancel{x-4}} = 7(x-4)$$

$$\frac{21}{7} = \frac{7(x-4)}{7}$$

$$3 = x - 4$$

$$+4 \quad +4$$

$$7 = x \quad \text{or} \quad x = 7$$

$$3 \quad 11 = 23 - 4x$$

$$+4x \quad +4x$$

$$4x + 11 = 23$$

$$-11 \quad -11$$

$$\frac{4x}{4} = \frac{12}{4}$$

$$x = 3$$

$$4 \quad 27 - 3x = 15$$

$$+3x \quad +3x$$

$$27 = 15 + 3x$$

$$-15 \quad -15$$

$$\frac{12}{3} = \frac{3x}{3}$$

$$4 = x \quad \text{or} \quad x = 4$$

$$5 \quad (\cancel{x-3}) 8 = \frac{24}{\cancel{x-3}} (\cancel{x-3})$$

$$\frac{8(x-3)}{8} = \frac{24}{8}$$

$$x - 3 = 3$$

$$+3 \quad +3$$

$$x = 6$$

$$6 \quad (\cancel{x+6}) 7 = \frac{77}{\cancel{x+6}} (\cancel{x+6})$$

$$\frac{7(x+6)}{7} = \frac{77}{7}$$

$$x + 6 = 11$$

$$-6 \quad -6$$

$$x = 5$$

$$7 \quad 41 - 2x = 9$$

$$+2x \quad +2x$$

$$41 = 9 + 2x$$

$$-9 \quad -9$$

$$\frac{32}{2} = \frac{2x}{2} \quad x = 16$$

$$8 \quad 25 = 80 - 11x$$

$$+11x \quad +11x$$

$$11x + 25 = 80$$

$$-25 \quad -25$$

$$\frac{11x}{11} = \frac{55}{11} \quad x = 5$$

Solving 2-Step Equations (with decimals)

AB-TSE 5

Instructions: Solve each equation. You can use a calculator to do the decimal arithmetic if you'd like to.

$$\begin{array}{r} 1 \quad 1.5 + 2x = 12.5 \\ -1.5 \quad -1.5 \end{array}$$

$$\frac{2x}{2} = \frac{11}{2}$$

$$x = 5.5$$

$$\begin{array}{r} 2 \quad \frac{3.5(x + 0.2) = 7}{\cancel{3.5} \quad 3.5} \end{array}$$

$$\begin{array}{r} x + 0.2 = 2 \\ -0.2 \quad -0.2 \end{array}$$

$$x = 1.8$$

$$3 \quad (\cancel{2}) \frac{x + 6.1}{2} = 3.4(2)$$

$$\begin{array}{r} x + 6.1 = 6.8 \\ -6.1 \quad -6.1 \end{array}$$

$$x = 0.7$$

$$4 \quad (\cancel{2.8}) \frac{x - 3}{2.8} = 1.2(2.8)$$

$$\begin{array}{r} x - 3 = 3.36 \\ +3 \quad +3 \end{array}$$

$$x = 6.36$$

$$5 \quad \frac{4(x - 1.9) = 5.2}{\cancel{4} \quad 4}$$

$$\begin{array}{r} x - 1.9 = 1.3 \\ +1.9 \quad +1.9 \end{array}$$

$$x = 3.2$$

$$6 \quad \frac{x}{1.1} + 3.6 = 4.3$$

$$\begin{array}{r} -3.6 \quad -3.6 \end{array}$$

$$(\cancel{1.1}) \frac{x}{1.1} = 0.7(1.1)$$

$$x = 0.77$$

$$7 \quad (\cancel{9}) \frac{x - 2.5}{9} = 4.5(9)$$

$$\begin{array}{r} x - 2.5 = 40.5 \\ +2.5 \quad +2.5 \end{array}$$

$$x = 43.0$$

$$8 \quad 3x + 1.8 = 7.2$$

$$\begin{array}{r} -1.8 \quad -1.8 \end{array}$$

$$\frac{3x}{3} = \frac{5.4}{3}$$

$$x = 1.8$$

$$9 \quad \frac{x}{0.4} - 2.3 = 7.2$$

$$\begin{array}{r} +2.3 \quad +2.3 \end{array}$$

$$(\cancel{0.4}) \frac{x}{0.4} = 9.5(0.4)$$

$$x = 3.8$$

$$10 \quad (\cancel{3.1}) \frac{x + 1.7}{3.1} = 6(3.1)$$

$$\begin{array}{r} x + 1.7 = 18.6 \\ -1.7 \quad -1.7 \end{array}$$

$$x = 16.9$$

Solving 2-Step Equations (with negative numbers)

AB-TSE 6

Instructions: Solve each equation.

$$\begin{aligned} 1 \quad & -5 + 2x = -17 \\ & +5 \qquad +5 \\ & \underline{2x = -12} \\ & \underline{2} \qquad \underline{2} \\ & x = -6 \end{aligned}$$

$$\begin{aligned} 2 \quad & \underline{-9(x - 9) = 27} \\ & \underline{-9} \qquad \underline{-9} \\ & x - 9 = -3 \\ & +9 \qquad +9 \\ & x = 6 \end{aligned}$$

$$\begin{aligned} 3 \quad & \underline{(-5)\frac{x + (-3)}{-5} = -6(-5)} \\ & x - 3 = 30 \\ & +3 \qquad +3 \\ & x = 33 \end{aligned}$$

$$\begin{aligned} 4 \quad & \underline{(-3)\frac{x + 15}{-3} = -2(-3)} \\ & x + 15 = 6 \\ & -15 \quad -15 \\ & x = -9 \end{aligned}$$

$$\begin{aligned} 5 \quad & \underline{\frac{3(x - 8)}{3} = \frac{-60}{3}} \\ & x - 8 = -20 \\ & +8 \qquad +8 \\ & x = -12 \end{aligned}$$

$$\begin{aligned} 6 \quad & \frac{x}{-2} + 10 = -3 \\ & \underline{-10} \quad \underline{-10} \\ & \underline{(-2)\frac{x}{-2} = -13(-2)} \\ & x = 26 \end{aligned}$$

$$\begin{aligned} 7 \quad & \underline{(-6)\frac{x + 8}{-6} = 2(-6)} \\ & x + 8 = -12 \\ & -8 \qquad -8 \\ & x = -20 \end{aligned}$$

$$\begin{aligned} 8 \quad & -3x - 3 = -15 \\ & +3 \qquad +3 \\ & \underline{-3x = -12} \\ & \underline{-3} \quad \underline{-3} \\ & x = 4 \end{aligned}$$

$$\begin{aligned} 9 \quad & \frac{x}{-9} - 1 = 9 \\ & +1 \quad +1 \\ & \underline{(-9)\frac{x}{-9} = 10(-9)} \\ & x = -90 \end{aligned}$$

$$\begin{aligned} 10 \quad & \underline{(-7)\frac{x - 12}{-7} = 4(-7)} \\ & x - 12 = -28 \\ & +12 \quad +12 \\ & x = -16 \end{aligned}$$

Solving 2-Step Equations

1 Solve for x

$$2x + 5 = 17$$

$$\begin{array}{r} -5 \\ -5 \end{array}$$

$$\frac{2x}{2} = \frac{12}{2}$$

$$x = 6$$

2 Solve for x

$$\frac{x}{3} - 6 = 4$$

$$\begin{array}{r} +6 \\ +6 \end{array}$$

$$(3)\frac{x}{3} = 10(3)$$

$$x = 30$$

3 Solve for x

$$20 = 8 + 4x$$

$$\begin{array}{r} -8 \\ -8 \end{array}$$

$$\frac{12}{4} = \frac{4x}{4}$$

$$3 = x \text{ or } x = 3$$

4 Solve for x

$$\frac{2(x + 9)}{2} = \frac{24}{2}$$

$$\begin{array}{r} x + 9 = 12 \\ -9 \\ -9 \end{array}$$

$$x = 3$$

5 Solve for x

$$\frac{15}{3} = \frac{3(x - 6)}{3}$$

$$\begin{array}{r} 5 = x - 6 \\ +6 \\ +6 \end{array}$$

$$11 = x \text{ or } x = 11$$

6 Solve for x

$$(5)\frac{x + 3}{5} = 4(5)$$

$$\begin{array}{r} x + 3 = 20 \\ -3 \\ -3 \end{array}$$

$$x = 17$$

7 Solve for x

$$5 = 9 - 2x$$

$$\begin{array}{r} +2x \\ +2x \end{array}$$

$$\begin{array}{r} 2x + 5 = 9 \\ -5 \\ -5 \end{array}$$

$$\frac{2x}{2} = \frac{4}{2} \quad x = 2$$

8 Solve for x

$$(\cancel{x-2})\frac{28}{\cancel{x-2}} = 4(x-2)$$

$$\frac{28}{4} = \frac{4(x-2)}{4}$$

$$\begin{array}{r} 7 = x - 2 \\ +2 \\ +2 \end{array} \quad x = 9$$