

HW 4-8 EQUATIONS AND INEQUALITIES

Name: Answer Key

Of the following four equations, one of them is solved correctly and three of them are not. Use what you know about solving equations using inverse operations to identify which equation is solved correctly. On the problem that is solved correctly, write "correct" and demonstrate that the answer is correct by plugging it back into the equation. If the equation is solved incorrectly, identify (as specifically as possible) what the mistake is and then solve the equation correctly next to it. You can use your notes and a calculator if necessary. ☺

A)
$$\begin{array}{r} -5x = 30 \\ +5 \quad +5 \\ \hline x = 35 \end{array}$$

$$\begin{array}{r} -5x = 30 \\ \hline -5 \quad -5 \\ \hline x = -6 \end{array}$$

$x = -6$ correct answer

B)
$$\begin{array}{r} -20 \leq 4x \\ \hline 4 \quad 4 \\ \hline -5 \geq x \end{array}$$

correct answer:
$$\boxed{-5 \leq x}$$

Incorrect. They added 5 when they should have divided by -5.

Incorrect. They should NOT have flipped the inequality because they did NOT divide by a negative #.

C)
$$\begin{array}{r} -5 = 18 + x \\ -18 \quad -18 \\ \hline -13 = x \end{array}$$

$$\boxed{-23 = x}$$
 correct answer

D)
$$\begin{array}{r} x + 9 = 20 \\ -9 \quad -9 \\ \hline x = 11 \end{array}$$

$11 + 9 = 20$
 $20 = 20$
✓

Incorrect. They did the right step, but $-5 - 18$ does NOT equal -13 it equals -23 .

correct!

One of the equations on this page is solved correctly, and three are solved incorrectly. (Same instructions as first page.)

A)
$$\begin{array}{r} 24 - 2x = 17 \\ -24 \quad -24 \\ \hline 2x = -7 \\ \frac{2x}{2} = \frac{-7}{2} \\ x = -3.5 \end{array}$$

$$\frac{-2x}{-2} = \frac{-7}{-2}$$

$$x = 3.5$$

Correct answer.

Incorrect. After subtracting the 24 from both sides, they should have had $-2x$ left.

B)
$$\begin{array}{r} 2.5(x+6) = 20 \\ -2.5 \quad -2.5 \\ \hline x+6 = 17.5 \\ -6 \quad -6 \\ \hline x = 11.5 \end{array}$$

$$\frac{2.5(x+6)}{2.5} = \frac{20}{2.5}$$

$$x+6 = 8$$

$$x = 2$$
 correct answer

Incorrect. The 2.5 should have been divided both sides by 2.5.

C)
$$\begin{array}{r} 7x - (-7) = 35 \\ +7 \quad +7 \\ \hline 7x = 42 \\ \frac{7x}{7} = \frac{42}{7} \\ x = 6 \end{array}$$

$$\begin{array}{r} 7x - (-7) = 35 \\ -7 \quad -7 \\ \hline 7x = 28 \\ \frac{7x}{7} = \frac{28}{7} \\ x = 4 \end{array}$$

Correct answer

Incorrect. They shouldn't added 7 to both sides, they should have subtracted 7.

D)
$$\frac{-8+x}{3} = 20$$

$$3 \cdot \frac{-8+x}{3} = 20 \cdot 3$$

$$\frac{-8+x}{3} = 60$$

$$-8+x = 60$$

$$+8 \quad +8$$

$$x = 68$$

$$\frac{-8+68}{3} = 20$$

$$\frac{60}{3} = 20$$

$$20 = 20$$

✓

Correct!

One of the equations on this page is solved correctly, and three are solved incorrectly. (Same instructions as first page.)

A) $\frac{3}{8}x = \frac{1}{2}$ $\frac{8}{3} \cdot \frac{3}{8}x = \frac{1}{2} \cdot \frac{8}{3}$

$\frac{2}{1} \cdot \frac{3}{8}x = \frac{1}{2} \cdot \frac{2}{1}$ $x = \frac{1}{2} \cdot \frac{8}{3}$

$x = \frac{8}{6}$

reduce

$x = \frac{4}{3}$ or $1\frac{1}{3}$

correct answer

B) $-44 \geq -5x + 19.5$ $-44 \geq -5x + 19.5$

-19.5 -19.5

$-63.5 \geq -5x$ $-44 \geq -5(12.7) + 19.5$

$\frac{-63.5}{-5} \geq \frac{-5x}{-5}$ $-44 \geq -63.5 + 19.5$

$12.7 \leq x$ $-44 \geq -44$

✓

Incorrect. They should have multiplied both sides by $\frac{8}{3}$ or divided both sides by $\frac{3}{8}$.

Correct!

C) $\frac{x}{-3} - 7 \leq 11$

$+7$ $+7$

$\frac{x}{-3} \leq 18$

$\cdot (-3)$ $\cdot (-3)$

$x \leq -54$

correct answer

$x \geq -54$

D) $-13 > \frac{x}{4} - 15$ $-13 > \frac{x}{4} - 15$

$+15$ $+15$

$2 > \frac{x}{4}$

$\cdot 4$ $\cdot 4$

$8 > x$

correct answer

Incorrect. They multiplied both sides by a -3 , but forgot to flip the inequality.

Incorrect. They needed to $+15$ to both sides **BEFORE** multiplying by 4 .

One of the equations on this page is solved correctly, and three are solved incorrectly. (Same instructions as first page.)

A) $-12x + (-6) = 24$

$$\begin{array}{r|l} +6 & +6 \\ \hline -12x & = \frac{30}{-12} \\ \hline & x = -2.5 \end{array}$$

$-12x + (-6) = 24$
 $-12(-2.5) + (-6) = 24$
 $30 + (-6) = 24$
 $24 = 24$ ✓

B) $\frac{7}{9}x - 10 = 11$

$$\begin{array}{r|l} +10 & +10 \\ \hline \frac{7}{9}x & = 21 \end{array} \rightarrow \frac{\frac{7}{9}x}{\frac{7}{9}} = \frac{21}{\frac{7}{9}}$$

$$\begin{array}{r|l} -\frac{7}{9} & -\frac{7}{9} \\ \hline x & = 20\frac{2}{9} \end{array}$$

$x = 27$

Correct answer

Correct!

Incorrect. The first step was correct but they should NOT have subtracted the $\frac{7}{9}$. They should have divided by $\frac{7}{9}$ or multiplied by $\frac{9}{7}$.

C) $-7 + 4x < 25$

$$\begin{array}{r|l} +7 & +7 \\ \hline 4x & \leq \frac{32}{4} \\ \hline & x \leq 8 \end{array}$$

$x < 8$ correct answer

D) $3(x+14) = 30$

$$\begin{array}{r|l} -14 & -14 \\ \hline 3x & = \frac{16}{3} \\ \hline x & = 5.\bar{3} \\ & \text{or } 5\frac{1}{3} \end{array}$$

$3(x+14) = 30$
 $x+14 = 10$

$x+14 = 10$
 $-14 \quad -14$

$x = -4$

Correct answer

Incorrect. They turned it into an equal sign ~~not~~ instead of keeping the inequality.

Incorrect. You cannot move the 14 first. You need to divide the 3 off or distribute it first.