

**Practice (6.3B)**

1. ~~Draw a model of each equation. Then, solve the equation.~~ → NOT ENOUGH SPACE. SEE NEXT PAGE

a)  $5 + \frac{r}{-2} = 1$

b)  $7 = \frac{q}{3} - 2$

c)  $\frac{v}{4} - 6 = 4$

d)  $-1 = 4 + \frac{z}{5}$

2. Solve each equation. Check your answer. → NOT ENOUGH SPACE. SEE NEXT PAGES

a)  $-3 = \frac{n}{7} - 7$

b)  $2 + \frac{a}{-8} = 4$

c)  $-4 + \frac{x}{11} = -1$

d)  $5 = \frac{e}{-6} + 10$

3. Show whether  $x = -12$  is the solution to each equation. → CHECK! SEE NEXT PAGES.

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

b)  $8 + \frac{x}{12} = 7$

c)  $0 = \frac{x}{4} - 3$

d)  $-10 = \frac{x}{-6} - 12$

4. Half of Xien's age added to 2 equals the age of her sister, Airah, who is 11. How old is Xien?

↳ LET  $x$  BE XIEN'S AGE.

THINK!

$$\frac{1}{2}x + 2 = 11$$

↳ NEXT PAGES!

5. Alex is working on the equation  $4x - 5 = 7$ . The first thing he does is divide the whole equation by 4. He writes  $\frac{4x}{4} - \frac{5}{4} = \frac{7}{4}$ . He thinks he may have done something wrong. Has he? Justify your answer.

Yes! Alex forgot the importance of the order of operations.

- $4x + 5$  tells us that  $x$  was multiplied by 4, then 5 was added.
- to "undo" this, first subtract 5, then divide by 4

\* Note that Alex has not made any mistakes in his math. He still could get the correct answer. However, his method is much more difficult

(SEE ATTACHED PAGES FOR MORE INFO)

$$\begin{aligned} \#1 \text{ a) } 5 + \frac{r}{-2} &= 1 \\ -5 \qquad \qquad -5 \\ \frac{r}{-2} &= -4 \\ \times(-2) \quad \times(-2) \\ \boxed{r = 8} \end{aligned}$$

$$\begin{aligned} \text{c) } \frac{v}{4} - 6 &= 4 \\ +6 \quad +6 \\ \frac{v}{4} &= 10 \\ \times 4 \quad \times 4 \\ \boxed{v = 40} \end{aligned}$$

$$\begin{aligned} \#2 \text{ a) } -3 &= \frac{n}{7} - 7 \\ +7 \quad +7 \\ 4 &= \frac{n}{7} \\ \times 7 \quad \times 7 \\ \boxed{28 = n} \end{aligned}$$

$$\begin{aligned} \text{CHECK: } -3 &= \frac{n}{7} - 7 \\ -3 &= \frac{(28)}{7} - 7 \\ -3 &= 4 - 7 \\ -3 &= -3 \quad (\checkmark) \end{aligned}$$

$$\begin{aligned} \text{b) } 7 &= \frac{q}{3} - 2 \\ +2 \quad +2 \\ q &= \frac{q}{3} \\ \times 3 \quad \times 3 \\ \boxed{27 = q} \end{aligned}$$

WRITING "q"  
INSTEAD OF "q"  
OR "q" MAKES  
IT EASIER TO  
AVOID MISTAKING  
IT FOR THE  
NUMBER NINE

$$\begin{aligned} \text{d) } -1 &= 4 + \frac{z}{5} \\ -4 \quad -4 \\ -5 &= \frac{z}{5} \\ \times 5 \quad \times 5 \\ \boxed{-25 = z} \end{aligned}$$

LINE THROUGH  
ZED, TO  
AVOID  
MISTAKING IT  
FOR TWO

$$\begin{aligned} \text{b) } 2 + \frac{a}{-8} &= 4 \\ -2 \quad -2 \\ \frac{a}{-8} &= 2 \\ \times(-8) \quad \times(-8) \\ \boxed{a = -16} \end{aligned}$$

$$\begin{aligned} \text{CHECK: } 2 + \frac{a}{-8} &= 4 \\ 2 + \frac{(-16)}{-8} &= 4 \\ 2 + 2 &= 4 \\ 4 &= 4 \quad (\checkmark) \end{aligned}$$

$$\#2 \text{ c) } -4 + \frac{x}{11} = -1$$

$$+4 \qquad \qquad \qquad +4$$

$$\frac{x}{11} = 3$$

$$\times 11 \qquad \qquad \times 11$$

$$\boxed{x = 33}$$

$$\text{CHECK: } -4 + \frac{x}{11} = -1$$

$$-4 + \frac{(33)}{11} = -1$$

$$-4 + 3 = -1$$

$$-1 = -1 \quad (\checkmark)$$

$$\#2 \text{ d) } 5 = \frac{e}{-6} + 10$$

$$-10 \qquad \qquad \qquad -10$$

$$-5 = \frac{e}{-6}$$

$$\times (-6) \quad \times (-6)$$

$$\boxed{30 = e}$$

$$\text{CHECK: } 5 = \frac{e}{-6} + 10$$

$$5 = \frac{(30)}{-6} + 10$$

$$5 = -5 + 10$$

$$5 = 5 \quad (\checkmark)$$

$$\#3 \text{ a) } \frac{x}{-3} + 6 = 2$$

$$\frac{(-12)}{-3} + 6 = 2$$

$$4 + 6 = 2$$

$$10 = 2 \quad (\times)$$

NO

$$\#3 \text{ b) } 8 + \frac{x}{12} = 7$$

$$8 + \frac{(-12)}{12} = 7$$

$$8 + (-1) = 7$$

$$7 = 7 \quad (\checkmark)$$

YES

$$\#3 \text{ c) } 0 = \frac{x}{4} - 3$$

$$0 = \frac{(-12)}{4} - 3$$

$$0 = -3 - 3$$

$$0 = -6 \quad (\times)$$

NO

$$\#3 \text{ d) } -10 = \frac{x}{-6} - 12$$

$$-10 = \frac{(-12)}{-6} - 12$$

$$-10 = 2 - 12$$

$$-10 = -10 \quad (\checkmark)$$

YES

- #4. **THINK!** ① IF KIEN'S AGE IS  $x$ ,  
 ② THEN HALF OF KIEN'S AGE IS  $\frac{1}{2}x$  OR  $\frac{x}{2}$   
 ③ THEN HALF OF KIEN'S AGE ADDED TO TWO  
 IS  $\frac{1}{2}x + 2$  OR  $\frac{x}{2} + 2$

↴

"HALF OF KIEN'S AGE ADDED TO 2" EQUALS THE AGE OF HER SISTER AIKHA, WHO IS 11.

$$\frac{1}{2}x \quad x \quad + 2 \quad = \quad 11$$

$$\frac{1}{2}x + 2 = 11$$

$$\begin{array}{r} -2 \quad -2 \\ \frac{1}{2}x = 9 \\ \div (\frac{1}{2}) \quad \div (\frac{1}{2}) \end{array}$$

$$\boxed{x = 18}$$

$$\begin{aligned} 9 \div \frac{1}{2} &= 9 \div \frac{1}{2} \\ &= 9 \times \frac{2}{1} \\ &= \frac{18}{1} \\ &= 18 \end{aligned}$$

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

$$-2 \quad -2$$

$$\frac{x}{2} = 9$$

$$\times 2 \quad \times 2$$

$$\boxed{x = 18}$$

#5. THE CORRECT WAY:

$$4x - 5 = 7$$

$$+5 \quad +5$$

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

$$\boxed{x = 3}$$

SALVAGING ALGER'S WAY:

$$4x - 5 = 7$$

$$\div (4) \quad \div (4)$$

$$\frac{4x}{4} - \frac{5}{4} = \frac{7}{4}$$

$$x - \frac{5}{4} = \frac{7}{4}$$

$$+ \frac{5}{4} \quad + \frac{5}{4}$$

$$x = \frac{12}{4} \frac{3}{1}$$

$$\boxed{x = 3}$$