

# The Hands-On Equations<sup>®</sup> Fractions Verbal Problems Book

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- More than 60 verbal problems
- 12 graduated lessons corresponding to the Hands-On Equations Fractions Learning System



## Sample Problem

Joseph is four-thirds of Carl's age. In 16 years, Joseph will be 2 years older than twice Carl's present age. How old is each now?

Let Carl's age be  $y$ .

After solving,  $y = \underline{\hspace{2cm}}$ .

Let Joseph's age be:  $\underline{\hspace{2cm}}$ .

Answer: Carl is  $\underline{\hspace{2cm}}$ ; Joseph is  $\underline{\hspace{2cm}}$ .

Check:  $\underline{\hspace{4cm}}$ .

# Introduction

Let's consider the following verbal problem (Lesson 5, Exercise 5) so that we can illustrate the process the student is expected to follow:

**Joseph is four-thirds of Carl's age. In 16 years, Joseph will be 2 years older than twice Carl's present age. How old is each now?**

Let Carl's age be  $y$ . After solving,  $y = \underline{\quad}$

Let Joseph's age be:  $\underline{\quad}$

Answer: Carl is  $\underline{\quad}$ ; Joseph is  $\underline{\quad}$ .

Check:  $\underline{\quad}$ .

After reading the problem the student enters the representation for Joseph's age, namely,  $4/3 y$ . Next, the student sets up the problem using the manipulatives:

Concrete representation of the verbal problem shown above



Next, the student solves this setup for the blue block and finds that its value is 7. This enables the student to conclude that the yellow block,  $y$ , is 21. Therefore, Carl's age, represented by the yellow block, is also 21. At this point, the student is ready to calculate Joseph's age. Since his age is four-thirds of Carl's age, Joseph is 28. To do the check, the student once again translates the verbal statement of the problem into the original physical setup, and then evaluates each side to obtain a check value of 44. This problem, with the blanks filled in, looks like this:

**Joseph is four-thirds of Carl's age. In 16 years, Joseph will be 2 years older than twice Carl's present age. How old is each now?**

Let Carl's age be  $y$ . After solving,  $y = \underline{21}$ .

Let Joseph's age be:  $\underline{4/3 y}$

Answer: Carl is  $\underline{21}$ ; Joseph is  $\underline{28}$ .

Check:  $\underline{44 = 44}$ .

Note: Students in the 7th and 8th grades should be encouraged to do the check in the verbal statement of the problem. For this specific problem, the check consists of two parts:

Part I: We verify that Joseph's age is  $4/3$  of Carl's age. Yes,  $28 = 4/3 \times 21$ .

Part II: We substitute the ages into the second sentence. We have:  $28 + 16 = 44$ ;  $2 \times 21 + 2 = 44$ .

Name: \_\_\_\_\_

Grade: \_\_\_\_\_

Date: \_\_\_\_\_

### Lesson 1

1. One-half of a number is 7. Find the number.

Let the number be  $y$ .

After solving,  $y =$  \_\_\_\_\_.

Answer: The number is \_\_\_\_\_.

Check: \_\_\_\_\_.

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2. Two-thirds of a number is 8. Find the number.

Let the number be  $y$ .

After solving,  $y =$  \_\_\_\_\_.

Answer: The number is \_\_\_\_\_.

Check: \_\_\_\_\_.

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3. Four-thirds of a number is 12. Find the number.

Let the number be  $y$ .

After solving,  $y =$  \_\_\_\_\_.

Answer: The number is \_\_\_\_\_.

Check: \_\_\_\_\_.

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4. Five-sixths of Jim's age is 15. How old is Jim?

Let Jim's age be  $y$ .

After solving,  $y =$  \_\_\_\_\_.

Answer: Jim is \_\_\_\_\_ years old.

Check: \_\_\_\_\_.

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5. Three-halves of Laura's age are 18. How old is Laura?

Let Laura's age be  $y$ .

After solving,  $y =$  \_\_\_\_\_.

Answer: Laura is \_\_\_\_\_ years old.

Check: \_\_\_\_\_.

Name: \_\_\_\_\_

Grade: \_\_\_\_\_

Date: \_\_\_\_\_

### Lesson 5

1. Cheryl is five-sixths of Sean's age. In 7 years, she will be 4 years older than Sean is now. How old is each?

Let Sean's age be  $y$ .

After solving,  $y = \underline{\hspace{2cm}}$ .

Let Cheryl's age be:

Answer: Sean is  $\underline{\hspace{2cm}}$ ; Cheryl is  $\underline{\hspace{2cm}}$ .

Check:  $\underline{\hspace{2cm}}$ .

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2. Sean is two-thirds of Tim's age. The sum of their ages, increased by 4, is the same twice Sean's age, increased by 10. How old is each?

Let Tim's age be  $y$ .

After solving,  $y = \underline{\hspace{2cm}}$ .

Let Sean's age be:

Answer: Tim is  $\underline{\hspace{2cm}}$ ; Sean is  $\underline{\hspace{2cm}}$ .

Check:  $\underline{\hspace{2cm}}$ .

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3. Tim is four-thirds of Juan's age. The sum of their ages, increased by 1, is the same as twice Juan's age, increased by 6. How old is each?

Let Juan's age be  $y$ .

After solving,  $y = \underline{\hspace{2cm}}$ .

Let Tim's age be:

Answer: Juan is  $\underline{\hspace{2cm}}$ ; Tim is  $\underline{\hspace{2cm}}$ .

Check:  $\underline{\hspace{2cm}}$ .

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4. Rosita is five-sixths of Carmen's age. In 10 years Rosita will be 5 years older than Carmen is now. How old is each now?

Let Carmen's age be  $y$ .

After solving,  $y = \underline{\hspace{2cm}}$ .

Let Rosita's age be:

Answer: Carmen is  $\underline{\hspace{2cm}}$ ; Rosita is  $\underline{\hspace{2cm}}$ .

Check:  $\underline{\hspace{2cm}}$ .

Name: \_\_\_\_\_

Grade: \_\_\_\_\_

Date: \_\_\_\_\_

### Lesson 9

1. It is very cold now at the *McMurdo Station* in the *Antarctica*. If I take half of the current temperature, and increase it by 5 degrees, I get 10 degrees centigrade below zero. What is the current temperature at the *McMurdo Station*?

Let the current temperature at the *McMurdo Station* be  $y$ . After solving,  $y =$  \_\_\_\_\_.

Answer: The current temperature at the *McMurdo Station* is \_\_\_\_\_.

Check: \_\_\_\_\_.

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2. Today is another cold day at the *McMurdo Station*. If I take two-sixths of the current temperature, and increase it by 3 degrees, I get 5 degrees below zero. What is the current temperature at the *McMurdo Station*?

Let the current temperature at the *McMurdo Station* be  $y$ . After solving,  $y =$  \_\_\_\_\_.

Answer: The current temperature at the *McMurdo Station* is \_\_\_\_\_.

Check: \_\_\_\_\_.

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3. One-third of my number, increased by 8, is 2. What is my number?

Let the number be  $y$ .

After solving,  $y =$  \_\_\_\_\_.

Answer: The number is \_\_\_\_\_.

Check: \_\_\_\_\_.

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4. Five-sixths of my number, increased by 11, is 1. What is my number?

Let the number be  $y$ .

After solving,  $y =$  \_\_\_\_\_.

Answer: The number is \_\_\_\_\_.

Check: \_\_\_\_\_.