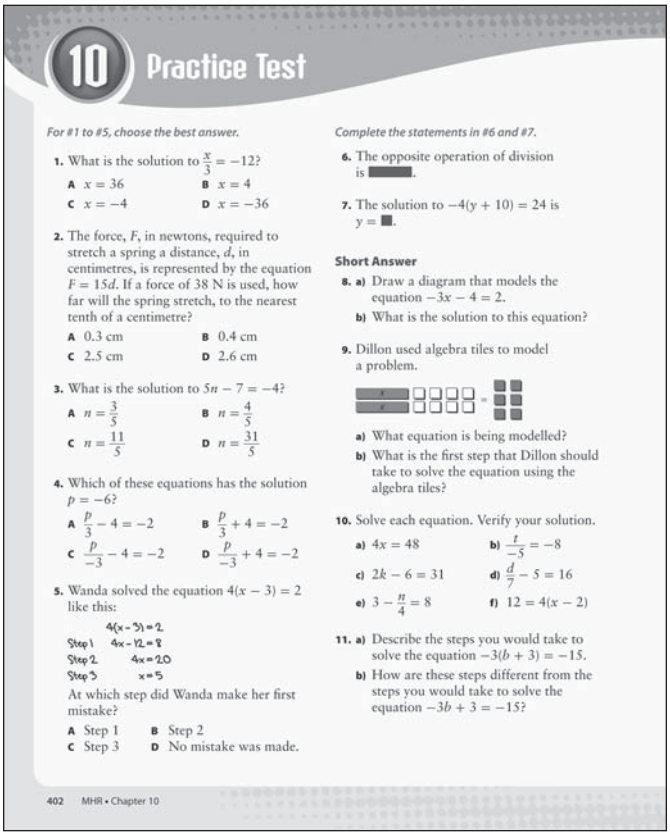
10 Practice Test



10 Practice Test

For #1 to #5, choose the best answer.

1. What is the solution to $\frac{x}{3} = -12$?
   A $x = 36$ B $x = 4$
   C $x = -4$ D $x = -36$

2. The force, F, in newtons, required to stretch a spring a distance, d, in centimetres, is represented by the equation $F = 15d$. If a force of 38 N is used, how far will the spring stretch, to the nearest tenth of a centimetre?
   A 0.3 cm B 0.4 cm
   C 2.5 cm D 2.6 cm

3. What is the solution to $5n - 7 = -4$?
   A $n = \frac{3}{5}$ B $n = \frac{4}{5}$
   C $n = \frac{11}{5}$ D $n = \frac{31}{5}$

4. Which of these equations has the solution $p = -6$?
   A $\frac{p}{3} - 4 = -2$ B $\frac{p}{3} + 4 = -2$
   C $\frac{p}{-3} - 4 = -2$ D $\frac{p}{-3} + 4 = -2$

5. Wanda solved the equation $4(x - 3) = 2$ like this:

   $4(x - 3) = 2$
   Step 1 $4x - 12 = 8$
   Step 2 $4x = 20$
   Step 3 $x = 5$

   At which step did Wanda make her first mistake?
   A Step 1 B Step 2
   C Step 3 D No mistake was made.

Complete the statements in #6 and #7.

6. The opposite operation of division is ■.

7. The solution to $-4(y + 10) = 24$ is $y =$ ■.

Short Answer

8. a) Draw a diagram that models the equation $-3x - 4 = 2$.
   b) What is the solution to this equation?

9. Dillon used algebra tiles to model a problem.

   a) What equation is being modelled?
   b) What is the first step that Dillon should take to solve the equation using the algebra tiles?

10. Solve each equation. Verify your solution.
    a) $4x = 48$ b) $\frac{t}{-5} = -8$
    c) $2k - 6 = 31$ d) $\frac{d}{7} - 5 = 16$
    e) $3 - \frac{n}{4} = 8$ f) $12 = 4(x - 2)$

11. a) Describe the steps you would take to solve the equation $-3(b + 3) = -15$.
    b) How are these steps different from the steps you would take to solve the equation $-3b + 3 = -15$?

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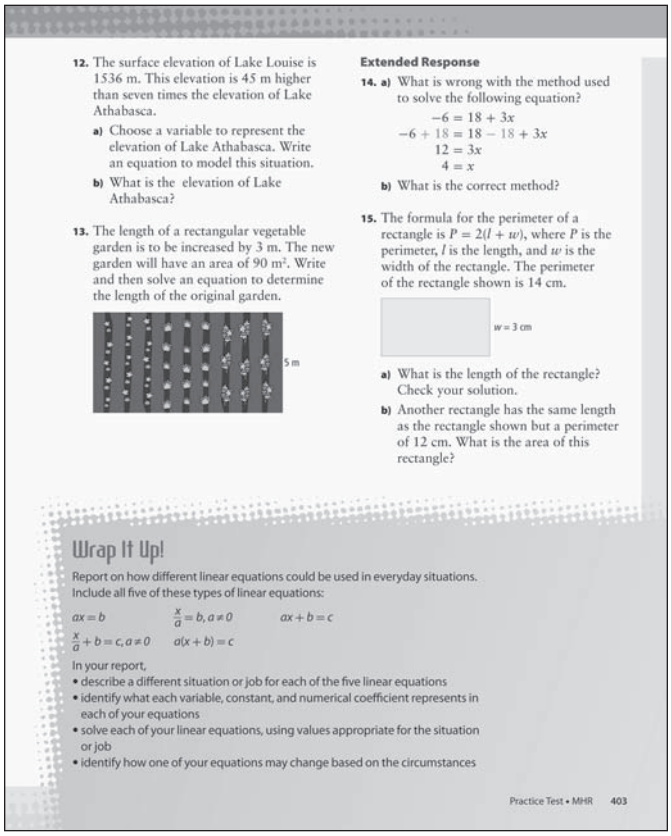

12. The surface elevation of Lake Louise is 1536 m. This elevation is 45 m higher than seven times the elevation of Lake Athabasca.
    a) Choose a variable to represent the elevation of Lake Athabasca. Write an equation to model this situation.
    b) What is the elevation of Lake Athabasca?

13. The length of a rectangular vegetable garden is to be increased by 3 m. The new garden will have an area of 90 m². Write and then solve an equation to determine the length of the original garden.

5 m

Extended Response

14. a) What is wrong with the method used to solve the following equation?

$-6 = 18 + 3x$
$-6 + 18 = 18 - 18 + 3x$
$12 = 3x$
$4 = x$

    b) What is the correct method?

15. The formula for the perimeter of a rectangle is $P = 2(l + w)$, where P is the perimeter, l is the length, and w is the width of the rectangle. The perimeter of the rectangle shown is 14 cm.

$w = 3$ cm

    a) What is the length of the rectangle? Check your solution.
    b) Another rectangle has the same length as the rectangle shown but a perimeter of 12 cm. What is the area of this rectangle?

Wrap It Up!

Report on how different linear equations could be used in everyday situations. Include all five of these types of linear equations:

$ax = b$ $\frac{x}{a} = b, a \neq 0$ $ax + b = c$
$\frac{x}{a} + b = c, a \neq 0$ $a(x + b) = c$

In your report,
- describe a different situation or job for each of the five linear equations
- identify what each variable, constant, and numerical coefficient represents in each of your equations
- solve each of your linear equations, using values appropriate for the situation or job
- identify how one of your equations may change based on the circumstances

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***MathLinks 8*, pages 402–403**

Suggested Timing
40–50 minutes

Materials
- algebra tiles
- cups and counters

Blackline Masters
Master 15 Algebra Tiles
BLM 10–13 Chapter 10 Test

Planning Notes

Encourage students to start the practice test by writing the question numbers in their notebooks. Have them indicate questions with which they need a little help, a lot of help, or no help. Suggest that students first complete the questions they know they can do. Then, have them complete the questions they know something about. Finally, have them do their best on the questions that they still find challenging.

This practice test can be assigned as an in-class or take-home assignment. Provide students with the number of questions they can comfortably do in one class. These are the minimum questions that will meet the related curriculum outcomes: #1–#5, #8, #10, #12, and #14.

Study Guide

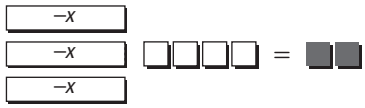
Question(s)	Section(s)	Refer to	The student can …
1, 6, 10	10.1	Example 1	✓ solve a one-step linear equation of the form $\frac{x}{a} = b$
2, 10	10.1	Example 1	✓ solve a one-step linear equation of the form $ax = b$
3, 11	10.2	Example 3	✓ solve a two-step linear equation of the form $ax + b = c$ and record the process
4, 10	10.3	Examples 1, 2	✓ solve a two-step linear equation of the form $\frac{x}{a} + b = c$
5	10.4	Example 2	✓ solve a two-step linear equation of the form $a(x + b)$ ✓ apply the distributive property to solve a linear equation ✓ correct an error in a solution to a two-step linear equation
7, 11, 15	10.4	Example 2	✓ solve a two-step linear equation of the form $a(x + b)$ and record the process ✓ apply the distributive property to solve a linear equation
8	10.2	Examples 2, 3	✓ draw a visual representation of the steps used to solve a linear equation ✓ solve a two-step linear equation of the form $ax + b = c$
9	10.4	Example 1	✓ model and solve a linear equation using algebra tiles ✓ solve a two-step linear equation of the form $a(x + b)$
10	10.2 10.4	Example 1 Examples 1, 2	✓ solve linear equations of the form $ax + b = c$ and $a(x + b)$ ✓ verify the solution to a linear equation
12	10.2	Examples 2, 3	✓ model and solve a problem with a two-step linear equation of the form $ax + b = c$
13	10.4	Examples 1, 2	✓ model and solve a problem with a two-step linear equation of the form $a(x + b)$ ✓ apply the distributive property to solve a linear equation
14	10.2	Example 1	✓ solve a two-step linear equation of the form $ax + b = c$ and record the process ✓ correct an error in a solution to a two-step linear equation

Answers

Chapter 10 Practice Test

1. D **2.** C **3.** A **4.** C **5.** A **6.** multiplication **7.** $y = -16$

8. a)



b) $x = -2$

9. a) $2(x - 4) = 6$ or $2x - 8 = 6$

b) Answers may vary. Example: Add eight positive 1-tiles to both sides of the equal sign.

10. a) $x = 12$ **b)** $t = 40$ **c)** $k = 18.5$ or $\frac{37}{2}$

d) $d = 147$ **e)** $n = -20$ **f)** $x = 5$

11. a) Answers may vary. Example: The first step is to divide both sides of the equation by −3. The second step is to subtract 3 from both sides of the equation. The solution is $b = 2$.

b) Answers may vary. Example: The first step is to subtract 3 from both sides of the equation. The second step is to divide both sides of the equation by −3. The solution is $b = 6$.

12. a) $7a + 45 = 1536$, where a represents the elevation of Lake Athabasca

b) The elevation of Lake Athabasca is 213 m.

13. $5(l + 3) = 90$. The length of the original garden is 15 m.

14. a) Answers may vary. Example: In the second line of the solution, 18 is added to −6 instead of subtracted from −6 on the left side of the equation.

b)
$$\begin{aligned} -6 &= 18 + 3x \\ -6 - 18 &= 18 - 18 + 3x \\ -24 &= 3x \\ -8 &= x \end{aligned}$$

15. a)
$$\begin{aligned} 14 &= 2(l + 3) \\ 7 &= l + 3 \\ 4 &= l \end{aligned}$$

The length of the rectangle is 4 cm.

Check:

Left Side $= 14$

$$\begin{aligned} \text{Right Side} &= 2(l + 3) \\ &= 2(4 + 3) \\ &= 2(7) \\ &= 14 \end{aligned}$$

Left Side = Right Side

b)
$$\begin{aligned} 12 &= 2(4 + w) \\ 6 &= 4 + w \\ 2 &= w \end{aligned}$$

The width of the new rectangle is 2 cm.

$$\begin{aligned} A &= l \times w \\ A &= 4 \times 2 \\ A &= 8 \end{aligned}$$

The area of the new rectangle is 8 cm^2.

Assessment	Supporting Learning
Assessment *as* Learning	
Chapter 10 Self-Assessment Have students review their earlier responses in the What I Need to Work On section of their chapter Foldable.	• Have students use their responses on the practice test and work they completed earlier in the chapter to identify areas in which they may need to reinforce their understanding of skills or concepts. Before the chapter test, coach them in the areas in which they are having difficulties.
Assessment *of* Learning	
Chapter 10 Test After students complete the practice test, you may wish to use **BLM 10–13 Chapter 10 Test** as a summative assessment.	• Some students will benefit from having a set of algebra tiles and/or cups and counters to help them model and solve the equations. If algebra tiles are not available, distribute **Master 15 Algebra Tiles**. • Consider allowing students to use their chapter Foldable. • Consider using the Math Games on page 404 or the Challenge in Real Life on page 405 to assess the knowledge and skills of students who have difficulty with tests.