

Eq. 8. Exercises.

If you wish to use the optional method of solving equations with fractions that was introduced in Lesson 2.2, then do the odd problems 1-6 below. If you do not intend to use this method on the test, you are not required to do these in your homework. If you do intend to use this method on the test, you are required to do these in your homework.

1. Solve: $\frac{y}{6} + \frac{1}{3} = \frac{11}{24}$
2. Solve: $\frac{7w}{12} - \frac{1}{2} = \frac{7}{18}$
3. Solve: $\frac{1}{4} \left(3x - \frac{1}{5} \right) = \frac{7}{10}$
4. Solve: $\frac{7}{8} \left(\frac{w}{4} + \frac{7}{12} \right) = 1 \frac{1}{6}$
5. Solve: $\frac{2}{3} \left(5t + \frac{6}{7} \right) = \frac{9}{7}$
6. Solve: $\frac{3}{4} \left(\frac{12}{5}t - \frac{26}{3} \right) = \frac{1}{4}$

Work the following problems. For each problem, (a) define the variable expression(s), (b) write an equation, (c) solve the equation and give all answers to the problem, and (d) check your answer.

7. If five times a number is increased by 3, the result is 38. Find the number.
8. If twice a number is decreased by four, the result is eighteen. Find the number.
9. If the sum of a number and eight is multiplied by six, the result is 126. Find the number.
10. The perimeter of a rectangle is 82 feet. The length is 7 feet longer than the width. Find the dimensions of the rectangle.
11. The perimeter of a rectangle is 64 centimeters. The length is 4 centimeters shorter than triple the width. Find the dimensions of the rectangle.
12. A triangle has a perimeter of 63 inches. The second side of the triangle is six inches shorter than the first side. The third side is 9 inches longer than double the first side. Find the length of each side of the triangle.
13. The perimeter of a triangle is 52 meters. The second side of the triangle is five times the first side. The third side is 2 meters shorter than three times the first side. Find the length of each side of the triangle.

14. A 137-ft long rope is cut into three pieces. The length of the second piece is twice the length of the first piece. The third piece is 9 ft longer than the first piece. Find the length of each piece of rope.

ANSWERS:

1. $y = 3/4$ 2. $w = 32/21$ 3. $x = 1$ 4. $w = 3$ 5. $t = 3/14$ 6. $t = 15/4$
7. a) Let $n =$ the number
b) $5n + 3 = 38$
c) The number is 7.
d) Five times 7 is 35, and 35 increased by 3 is 38. It checks.
8. a) Let $n =$ the number
b) $2n - 4 = 18$
c) The number is 11.
d) Twice 11 is 22, decreased by 4 is 18. It checks.
9. a) Let $n =$ the number
b) $6(n + 8) = 126$
c) The number is 13.
d) The sum of 13 and 8 is 21 and 21 multiplied by 6 is 126. It checks.
10. a) Let $x =$ the width of the rectangle in ft
Then $x + 7 =$ the length of the rectangle in ft
b) $2(x + 7) + 2(x) = 82$, or
 $x + (x + 7) + x + (x + 7) = 82$, or
 $4x + 14 = 82$
c) The width is 17 ft.
The length is 24 ft.
d) Since 24 is 7 longer than 17, that part checks. The perimeter is twice the length plus twice the width and twice 24 is 48, twice 17 is 34, and the sum of 48 and 34 is 82. It checks.
11. a) Let $x =$ the width of the rectangle in cm
Then $3x - 4 =$ the length of the rectangle in cm
b) $2(3x - 4) + 2(x) = 64$, or
 $x + (3x - 4) + x + (3x - 4) = 64$, or
 $8x - 8 = 64$
c) The width is 9 cm.
The length is 23 cm.
d) Triple 9 is 27, and four less than 27 is 23. So that part checks. The perimeter

is twice the length plus twice the width. Twice 9 is 18 and twice 23 is 46. The sum of 18 and 46 is 64. It checks.

12. a) Let x = the length of the first side in inches
Then $x - 6$ = the length of the second side in inches
Then $2x + 9$ = the length of the third side in inches
b) $x + (x - 6) + (2x + 9) = 63$, or
 $4x + 3 = 63$
c) The sides are 15 inches, 9 inches, and 39 inches.
d) Since 9 is 6 less than 15, that checks. Since 39 is 9 more than twice 15, that checks. And since $15+9+39$ is 63, that checks as well.
13. a) Let x = the length of the first side in meters
Then $5x$ = the length of the second side in meters
Then $3x - 2$ = the length of the third side in meters
b) $x + 5x + (3x - 2) = 52$, or
 $9x - 2 = 52$
c) The sides are 6 meters, 30 meters, and 16 meters.
d) Since 30 is five times 6, that checks. Since 16 is two less than three times 6, that checks. The perimeter is the sum of the lengths, and since $6+30+16$ is 52, that checks.
14. a) Let x = the length of the first piece in ft
Then $2x$ = the length of the second piece in ft
Then $x + 9$ = the length of the third piece in ft
b) $x + 2x + (x + 9) = 137$, or
 $4x + 9 = 137$
c) The pieces are 32 ft, 64 ft, and 41 ft.
d) Since 64 is twice 32, that checks. Since 41 is 9 more than 32, that also checks. Since $32+64+41$ is 137, that checks.