Solve the equation. Check your solution.

1. \( x - 9 = 12 \)
2. \( 3x - 2 = 16 \)
3. \( 3 - x = 2 \)
4. \( -4 = x - 1 \)
5. \( 3 = 2 + x \)
6. \( -14 + 2x = 6 \)
7. \( 6x = 24 \)
8. \( -4x = -14 \)
9. \( \frac{3}{2}x + 1 = 13 \)
10. \( \frac{2}{3}x + 10 = 0 \)
11. \( \frac{4}{3}x + 2 = 6 \)
12. \( x + 6 = 3(5 - x) \)
13. \( x + \frac{3}{2} = \frac{3}{4}(x - \frac{1}{2}) \)
14. \( 3(x - 2) = 2(2x - 3) \)
15. \( x + \frac{3}{5} = \frac{7}{5}(x + 1) \)
16. \( \frac{1}{2}(14x + 2) = 3(2 - 3x) \)
17. \( 5x = \frac{4}{5}(5x - 2) \)
18. \( x + 6 = 3(3 - x) \)
19. \( \frac{5}{4}(4x + 2) = 3 \)
20. \( 27 - 2x = 2(x + 1) \)
21. \( x + 4 = 2x - 8(\frac{1}{4}x - \frac{1}{4}) \)

22. **Perimeter** The perimeter of the rectangle below is 78 feet. Find its dimensions.

```
2x - 4

2x + 3
```

23. **Movie Tickets** A movie ticket costs $6.50. You have $35.00 to buy tickets and popcorn for four people. How much money is left to buy popcorn after the tickets are paid for?

24. **Pay Rate** You need to earn $475 per week to afford the new car you want to purchase. Your work week is 45 hours. You get 1.5 times the regular hourly rate for overtime (anything over 40 hours). How much does your hourly rate need to be?

25. **Car Bill** The bill for your automobile repairs was $265.74. The cost for labor was $52.00 per hour. The cost for materials was $135.74. How many hours did the mechanic work on your automobile?

26. **Road Trip** On Friday, you drove 145 miles to stay at your grandmother’s house. On Sunday, you returned home and calculated that the round trip travel time was 5 hours. What was your average speed?
Substitute the given value of $x$ into the equation. Then solve the equation for $y$.

1. $7x - 3y = 6; x = 3$
2. $6x + 5y = -7; x = -2$
3. $xy = 12 + 3x; x = 4$
4. $\frac{2}{3}x = 2y - \frac{2}{5}x = -9$
5. $\frac{2}{3}y + \frac{1}{2}x = 1; x = 12$
6. $x - 2y = 3xy + 1; x = -2$

Solve the equation for $y$. Then find the value of $y$ for the given value of $x$.

7. $3x - 6y = 6; x = 2$
8. $-2x + 2 = 5y - 1; x = 5$
9. $2xy + 1 = xy + 3; x = 2$
10. $\frac{1}{2}x - y = \frac{3}{2}x - 3; x = 7$
11. $\frac{3}{4}x + \frac{4}{7}y = \frac{5}{4}x - 1; x = 8$
12. $\frac{3}{5}y - 4x = 3 - 2y; x = 9$

Solve the formula for the indicated variable.

13. **Fahrenheit to Celsius**
   
   Solve for $F$: $C = \frac{5}{9}(F - 32)$

14. **Perimeter of a Parallelogram**
   
   Solve for $b$: $P = 2b + 2s$

15. **Perimeter of a Triangle**
   
   Solve for $c$: $P = a + b + c$

16. **Area of a Rhombus**
   
   Solve for $d_1$: $A = \frac{1}{2}d_1d_2$

17. **Area of a Trapezoid**
   
   Solve for $b_1$: $A = \frac{1}{2}(b_1 + b_2)h$

18. **Volume of a Right Circular Cylinder**
   
   Solve for $h$: $V = \pi r^2h$

19. **Lateral Surface Area of a Right Circular Cylinder**
   
   Solve for $h$: $S = 2\pi rh$

20. **Volume of a Right Circular Cone**
   
   Solve for $h$: $V = \frac{\pi r^2h}{3}$

Solve the formula for the indicated variable. Then use the given information to find the value of the variable. Include units of measure in the answer.

21. **Area of a Parallelogram**
   
   Solve for $h$: $A = bh$

   Find $h$ when $A = 81$ cm$^2$ and $b = 9$ cm.

22. **Celsius to Fahrenheit**
   
   Solve for $C$: $F = \frac{9}{5}C + 32$

   Find $C$ when $F = 77^\circ F$.

Basketball  
A regulation size basketball has a volume of 455.9 cubic inches. Use this information to answer the following questions. Approximate your answers to the nearest tenth.

23. The formula for the volume of a sphere is $V = \frac{4}{3}\pi r^3$. What is the radius of the basketball?

24. What is the diameter of the basketball?

25. The formula for the circumference of the basketball is $C = 2\pi r$. If the circumference of a basketball is 29 inches, is it a regulation size basketball?