SOLVING EQUATIONS IN CONTEXT 6.2.4 – 6.2.7

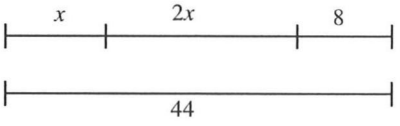
Initially, equations are solved either by applying math facts (for example, $4x = 12$, since $4 \cdot 3 = 12$, $x = 3$) or by matching equal quantities, simplifying the equation, and using math facts as shown in the examples below. Equations are often written in the context of a geometric situation.

Write an equation that represents each situation and find the value of the variable.

Example 1

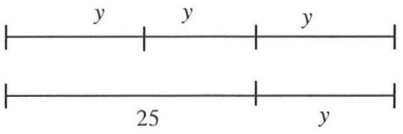
$$x + 10 = 32$$
$$x = 22$$

Example 2



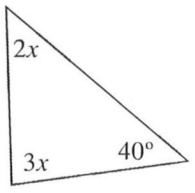
$$x + 2x + 8 = 44$$
$$x + 2x = 36$$
$$3x = 36$$
$$x = 12$$

Example 3



$$3y = 25 + y$$
$$2y = 25$$
$$y = 12.5$$

Example 4

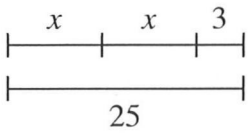


$$2x + 3x + 40 = 180$$
$$2x + 3x = 140$$
$$5x = 140$$
$$x = 18$$

Problems

Write an equation that represents each situation and then find the value of the variable.

1.



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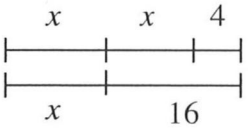

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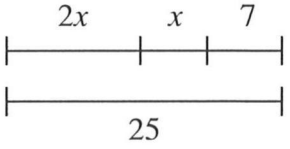

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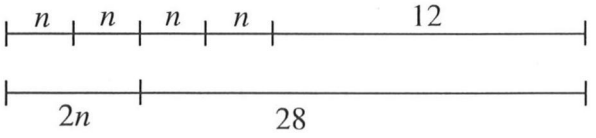

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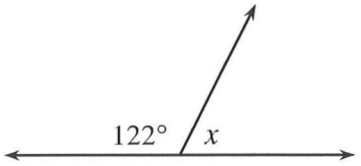

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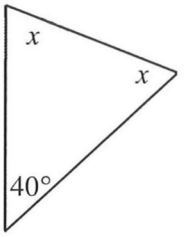

Solve each equation.

7. $x + 7 = -9$

8. $y - 2 = -3$

9. $-3y = 24$

10. $\frac{m}{2} = -6$

11. $3x + 2 = 11$

12. $4x + x + 5 = 25$

13. $m + 2m + 7 = m + 11$

14. $x + 9 + x + x = 30$

15. $3 - y = 9$

16. $4k + 1 = -7$

17. $x + 3x + x + 7 = 52$

18. $3m + 7 = m + 11$

19. $2(y + 3) = -12$

20. $3(c + 2) + c + 1 = 57$

Answers

1. $2x + 3 = 25$; $x = 11$
2. $2x + 4 = x + 16$; $x = 12$
3. $3x + 7 = 25$; $x = 6$
4. $4n + 12 = 2n + 28$; $n = 8$
5. $122 + x = 180$; $x = 58^\circ$
6. $2x + 40 = 180$; $x = 70^\circ$
7. $x = -16$
8. $y = -1$
9. $y = -8$
10. $m = -12$
11. $x = 3$
12. $x = 4$
13. $m = 2$
14. $x = 7$
15. $y = -6$
16. $k = -2$
17. $x = 9$
18. $m = 2$
19. $y = -9$
20. $c = 12.5$