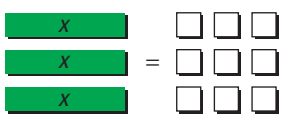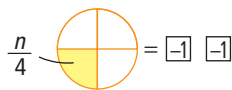## Key Words

For #1 to #7, choose the word from the list that goes in each blank.

variable   distributive property   equation linear equation   constant   numerical coefficient opposite operations

1. A letter that represents an unknown number is called a(n) ▓▓▓▓▓.

2. A mathematical statement with two expressions that have the same value is called a(n) ▓▓▓▓▓.

3. Multiplication and division are ▓▓▓▓▓ ▓▓▓▓▓.

4. A number that multiplies the variable is called a(n) ▓▓▓▓▓ ▓▓▓▓▓.

5. $5(b + 3) = 5 \times b + 5 \times 3$ is an example of how you use the ▓▓▓▓▓ ▓▓▓▓▓.

6. A number that does not change and that is added or subtracted from the value of an expression is called a(n) ▓▓▓▓▓.

7. An equation that, when graphed, results in points that lie along a straight line is called a(n) ▓▓▓▓▓ ▓▓▓▓▓.

10.1 Modelling and Solving One-Step Equations: $ax = b$, $\frac{x}{a} = b$, pages 370–379

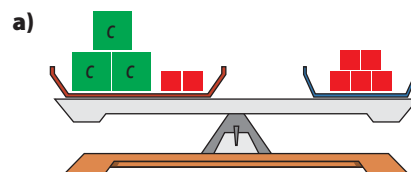**8.** Solve the equation modelled by each diagram. Check your solution.

a)

b)

$\frac{n}{4}$

c)

d)

$\frac{x}{3}$

9. Solve by inspection.

   a) $-22 = -11x$ **b)** $6r = -18$

   c) $-8 = 2z$ **d)** $-5t = 15$

10. Solve each equation. Check your answer.

   a) $-5 = \frac{p}{3}$ **b)** $\frac{n}{-11} = 3$

   c) $-9 = \frac{x}{-4}$ **d)** $\frac{a}{-2} = -7$

11. Write two different equations that have a solution of 5 and that can be solved using multiplication or division.

10.2 Modelling and Solving Two-Step Equations: $ax + b = c$, pages 380–387

12. Write and solve the equation modelled by each diagram. Check your solution.

a)

b)

13. Show whether $x = -5$ is the solution to each equation.

   a) $-7x - 2 = 33$ **b)** $4 - 3x = 19$

   c) $-28 = 5x - 3$ **d)** $30 = 2x + 20$

14. Solve each equation. Check your solution.

   a) $-3t + 8 = 20$ **b)** $5j - 2 = -127$

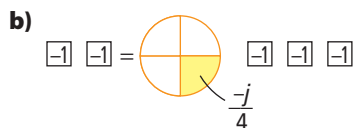   **c)** $-12 + 9p = 24$ **d)** $130 = 12n - 5$

15. Zoë has a collection of CDs and DVDs. The number of CDs she has is three fewer than four times the number of DVDs. Zoë has 25 CDs.

   a) Choose a variable to represent the number of DVDs Zoë has. Write an equation that represents this situation.

   b) How many DVDs does Zoë have?

10.3 Modelling and Solving Two-Step Equations: $\frac{x}{a} + b = c$, pages 388–393

16. Solve the equation modelled by each diagram. Check your solution.

   a)

   $\frac{v}{5}$ ... $\boxed{+1}\ \boxed{+1}\ \boxed{+1}\ \boxed{+1}$ $\boxed{+1}\ \boxed{+1}\ \boxed{+1}$ $= \boxed{-1}\ \boxed{-1}$

   b)

   $\boxed{-1}\ \boxed{-1} =$ ... $\boxed{-1}\ \boxed{-1}\ \boxed{-1}$ $\frac{-j}{4}$

17. Identify the first operation and the second operation you should perform to solve each equation.

   a) $\dfrac{t}{-3} + 13 = 9$ **b)** $\dfrac{r}{15} - 7 = -11$

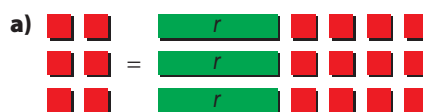   **c)** $2 - \dfrac{x}{22} = 17$ **d)** $13 = -16 - \dfrac{h}{4}$

18. Solve. Verify your answer.

   a) $3 - \dfrac{v}{-3} = 7$ **b)** $\dfrac{d}{3} - 13 = -8$

   c) $17 = -4 + \dfrac{x}{-2}$ **d)** $-2 = \dfrac{n}{4} - 11$

19. According to the Canadian Soccer Association, in 2006, Saskatchewan's number of registered players was 1120 fewer than $\frac{1}{5}$ the number of soccer players registered in British Columbia. Saskatchewan had 23 761 registered soccer players that year. Write and solve an equation to determine how many players British Columbia had.

10.4 Modelling and Solving Two-Step Equations: $a(x + b) = c$, pages 394–399

20. Solve the equation modelled by each diagram. Check your solution.

   a)

   b)

21. Solve. Verify your solution.

   a) $6(q - 13) = -24$ **b)** $-14 = 2(g + 4)$

   c) $-18 = -6(k + 17)$ **d)** $16 = -4(x - 5)$

22. Diane wishes to create a square Star Quilt like the one shown. There will be a 3-cm border around the quilt and the perimeter of the completed quilt will be 372 cm. Write and solve an equation to determine the dimensions of the quilt before she adds the border.

23. Each side of a regular octagon is decreased by 3 cm. If the perimeter of the new octagon is 48 cm, what was the measure of each side of the original octagon?

CH 10 Math Review. P 400 # 8, 12, 13, 14, 17, 18, 20, 21, 23

Pg 400

8a) $\dfrac{3x}{3} = \dfrac{-9}{3}$

$x = -3$

Verify: $3(-3) = -9$

$-9 = -9$ ✓

8 c) $\dfrac{-5d}{-5} = \dfrac{-10}{-5}$

$d = 2$

Verify: $-5(2) = -10$

$-10 = -10$ ✓

12. a) $3c + 2 \overset{-2}{=} 5 \overset{-2}{}$

$\dfrac{3c}{3} = \dfrac{3}{3}$

$c = 1$

Verify: $3(1) + 2 = 5$

$5 = 5$

b) $-4x + 7 \overset{-7}{=} -1 - 7$

$\dfrac{-4x}{-4} = \dfrac{-8}{-4}$

$x = 2$

Verify: $-4(2) + 7 = -1$

$-8 + 7 = -1$

$-1 = -1$ ✓

V_4

13. a) $-7x - 2 = 33$

$-7(-5) - 2 = 33$

$35 - 2 = 33$

$33 = 33$ ✓

yes, $x = -5$

b) $4 - 3(-5) = 19$

$4 - (-15) = 19$

$19 = 19$

yes, $x = -5$

13. c) $-28 = 5(-5) - 3$

$-28 = -25 - 3$

$-28 = -28$

yes, $x = -5$

d) $30 = 2(-5) + 20$

$30 = -10 + 20$

$30 = 10$

No, $x \neq -5$

4!

a) $-3t + 8 = 20 - 8$

$$\frac{-3t}{-3} = \frac{12}{-3}$$

$$t = -4$$

b) $5j - 2^{+2} = -127 + 2$

$$\frac{5j}{5} = \frac{-125}{5}$$

$$j = -25$$

14) c) $-\cancel{12}^{+12} + 9p = 24^{+12}$

$$\frac{9p}{9} = \frac{36}{9}$$

$$P = 4$$

d) $130^{+5} = 12n - 5^{+5}$

$$\frac{135}{12} = \frac{12n}{12}$$

$$11.25 = n$$

CH10: Solving Linear Equations Review

18. a) $3^{-3} - \dfrac{V}{-3} = 7^{-3}$

$\dfrac{-V}{-3} = 4$

↗ "negative ÷
negative
= positive

$\dfrac{V}{3} \times 3 = 4^{\times 3}$

$V = \boxed{12}$

Verify:

$3 - \dfrac{12}{-3} = 7$

$3 - (-4) = 7$

$7 = 7$ ✓

---

b) $\dfrac{d}{3} - 13^{+13} = -8^{+13}$

$\dfrac{d}{3} \times 3 = 5 \times 3$

$d = 15$

Verify

$\dfrac{15}{3} - 13 = -8$

$5 - 13 = -8$

$-8 = -8$ ✓

---

c) $17^{+4} = -4^{+4} + \dfrac{x}{-2}$

$21^{\times -2} = \dfrac{x}{-2} \times -2$

$-42 = x$

Verify:

$17 = -4 + \dfrac{-42}{-2}$

$17 = -4 + 21$

$17 = 17$ ✓

---

d) $-2^{+11} = \dfrac{n}{4} - 11^{+11}$

$9^{\times 4} = \dfrac{n}{4} \times 4$

$36 = n$

Verify: $-2 = \dfrac{36}{4} - 11$

$-2 = 9 - 11$

$-2 = -2$ ✓

$\boxed{2/4}$

20a) $6 = 3r + \cancel{12}^{-12}$ $\quad$ Verify:

$\dfrac{-6}{3} = \dfrac{3r}{3}$ $\qquad\qquad$ $6 = 3(-2) + 12$

$-2 = r$ $\qquad\qquad\quad$ $6 = -6 + 12$

$\qquad\qquad\qquad\qquad\quad$ $6 = 6 \quad \checkmark$

b) $-4 \overset{-5}{=} 2w + 5^{-5}$ $\quad$ Verify: $-4 = 2(-4.5) + 5$

$\dfrac{-9}{2} = \dfrac{2w}{2}$ $\qquad\qquad$ $-4 = -9 + 5$

$\qquad\qquad\qquad\qquad$ $-4 = -4 \quad \checkmark$

$-4.5 = w$

21. a) $\dfrac{\cancel{6}(q - 13)}{\cancel{6}} = \dfrac{-24}{6}$ $\quad$ Verify: $6(9 - 13) = -24$

$\qquad q - 13 \overset{+13}{=} -4 + 13$ $\qquad$ $6(-4) = -24$

$\qquad q = 9$ $\qquad\qquad\qquad$ $-24 = -24 \quad \checkmark$

b) $\dfrac{-14}{2} = \dfrac{2(g + 4)}{2}$ $\quad$ Verify: $-14 = 2(-11 + 4)$

$-7 \overset{-4}{=} g + 4^{-4}$ $\qquad\qquad$ $-14 = 2(-7)$

$-11 = g$ $\qquad\qquad\qquad$ $-14 = -14 \quad \checkmark$

$\textstyle\frac{3}{4}$

c) $\dfrac{-18}{-6} = \dfrac{-6(K+17)}{-6}$

$3^{-17} = K + 17^{-17}$

$-14 = K$

Verify: $-18 = -6(-14+17)$

$-18 = -6(3)$

$-18 = -18$ ✓
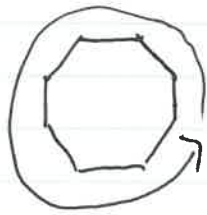
d) $\dfrac{16}{-4} = \dfrac{-4(x-5)}{-4}$

$-4^{+5} = x - 5^{+5}$

$1 = x$

Verify $16 = -4(1-5)$

$16 = -4(-4)$

$16 = 16$ ✓

23.

New:
48cm around.
each side = 6cm.

$\dfrac{48}{8} = \dfrac{8(x-3)}{8}$

$6^{+3} = x - 3^{+3}$

$9 = x$

Each side was 9cm.

$\left(\dfrac{4}{4}\right)$