Chapter Review

Frequently Asked Questions

Q: How are an algebraic expression and an algebraic equation different?

A:

An algebraic expression... Examples: $3n$ $b + 4$ $2p - 7$	**An algebraic equation...** Examples: $3n = 6$ $b + 4 = 13$ $2p - 7 = 37$
... is like a word phrase	... is like a word sentence
... may contain one or more operation signs but does not have an equal sign	... may contain one or more operation signs and does have an equal sign
... can be evaluated by substituting a number for each variable, then calculating	... can be solved by determining the value of the variable that makes the equation true, or the left side equals the right side

Q: How do you solve an equation by inspection?

A: Solve for the variable by thinking about what steps are suggested by the equation. For example, solve $3b + 5 = 26$ by inspection.

- Since you add 5 to $3b$ to get 26, $3b$ must be 21.
- Use your mental math skills to solve for the variable. Since 3 times a number is 21, the number must be 7.
- Check your answer by substituting the value you got for the variable into the original equation. Both sides of the equation should have the same value. If not, try again.

$$3b + 5 = 26$$
$$3b = 21$$
$$b = 7$$

Check.

Left side: $3b + 5 = 3(7) + 5 = 21 + 5 = 26$ ✓

Right side: 26

Q: How do you use systematic trial to solve an equation?

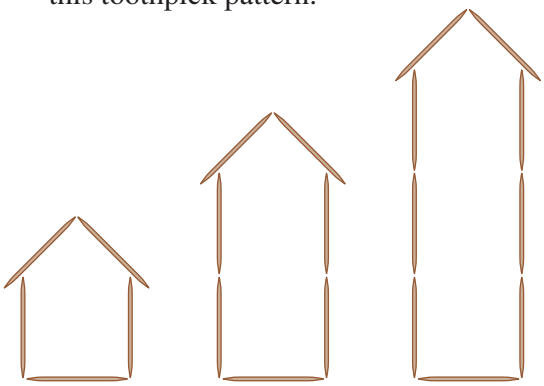
A: Follow these steps to solve the equation $2p - 7 = 37$.

- Use your estimating skills to guess the value of the variable.
- Test your prediction by substituting for the variable.
- Calculate to see if your solution makes the equation true. If not, use the value of your last guess to help you make another guess.

Predict p.	**Evaluate $2p - 7$.**	**Is this the correct solution?**
30	$2(30) - 7 = 60 - 7 = 53$	No, it's way too high.
25	$2(25) - 7 = 50 - 7 = 43$	I'm getting closer.
22	$2(22) - 7 = 44 - 7 = 37$	Correct!

Practice Questions

(8.2) **1. a)** Make a table of values for this toothpick pattern.



b) Explain the relationship between the figure number and the number of toothpicks in each figure.

c) Write an algebraic expression to represent the pattern rule.

(8.3) **2.** Write each phrase as an algebraic expression.

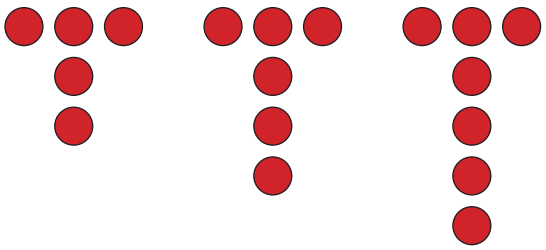
a) a number decreased by 38

b) the sum of 83 and a number

c) four times a number

d) 79 added to twice a number

(8.4) **3. a)** Use the equation $4 + n = c$ to determine the number of the figure you could build with 19 counters in this pattern.



b) How may counters do you need to build the 21st figure in the pattern?

4. Solve each equation by inspection. Explain your thinking. (8.4)

a) $3n = 33$

b) $9 + w = 10$

c) $r - 15 = 30$

d) $2y + 3 = 11$

5. Solve each equation by systematic trial. (8.5)

a) $x - 68 = 192$

b) $g + 33 = 251$

c) $3z - 16 = 74$

d) $15h + 9 = 84$

6. Match each description with the correct equation. Then solve for the variable in each equation. (8.5)

a) When four is added to a number, the sum is twenty.

b) When a number is multiplied by four, the product is forty.

c) When four is subtracted from a number, the difference is forty.

A. $n - 4 = 40$

B. $n + 4 = 20$

C. $4n = 40$

7. Which solution is correct? Explain. (8.5)

a) $7n = 84$ $n = 12$ or $n = 77$

b) $k - 9 = 79$ $k = 70$ or $k = 88$

c) $p + 14 = 40$ $p = 26$ or $p = 54$

d) $4w + 4 = 52$ $w = 12$ or $w = 13$

8. Solve the equation $83 = 7m - 1$. (8.5)

9. Describe one advantage of each strategy for solving the equation $5y - 20 = 20$. (8.5)

a) inspection

b) systematic trial