

# CHAPTER

# 1

# Number Connections

## GETTING STARTED

### Warm Up

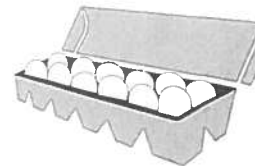
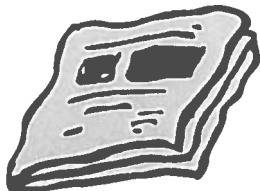
- 1.1** Choosing a Calculation Method
- 1.2** Problem Solving: Look for a Pattern
- 1.3** Place Value
- 1.4** Rounding Numbers: Mental Math
- 1.5** Exponents
- 1.6** Scientific Notation
- 1.7** Problem Solving: Guess and Check
- 1.8** Factors and Divisibility
- 1.9** Problem Solving: Make an Assumption

*Review*

*Chapter Check*

*Problem Solving: Using the Strategies*

Answers CHAPTER 1 Number Connections





## Skill Builder

### Break the Code

To decode these important messages, **solve** the questions below.

Each time your answer appears in the code, write the letter of that question above it.

#### Message 1:

$\overline{25}$     $\overline{20}$     $\overline{175}$     $\overline{70}$     $\overline{70}$     $\overline{20}$     $\overline{150}$     $\overline{100}$     $\overline{75}$     $\overline{2500}$     $\overline{30}$     $\overline{125}$

#### Message 2:

$\overline{2500}$     $\overline{30}$     $\overline{10}$     $\overline{0}$     $\overline{75}$     $\overline{25}$     $\overline{30}$     $\overline{175}$     $\overline{75}$

$\overline{60}$     $\overline{250}$     $\overline{50}$     $\overline{90}$     $\overline{75}$     $\overline{125}$     $\overline{70}$     $\overline{90}$     $\overline{40}$     $\overline{70}$

A.  $\begin{array}{r} 10 \\ \times 2 \end{array}$    C.  $\begin{array}{r} 10 \\ \times 0 \end{array}$    E.  $\begin{array}{r} 10 \\ \times 3 \end{array}$    G.  $\begin{array}{r} 10 \\ \times 4 \end{array}$    H.  $\begin{array}{r} 10 \\ \times 7 \end{array}$    I.  $\begin{array}{r} 10 \\ \times 9 \end{array}$

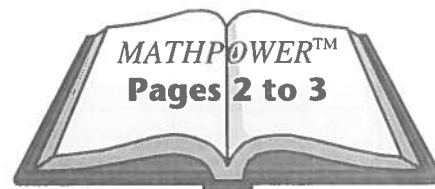
J.  $\begin{array}{r} 10 \\ \times 6 \end{array}$    L.  $\begin{array}{r} 10 \\ \times 1 \end{array}$    M.  $\begin{array}{r} 25 \\ \times 1 \end{array}$    N.  $\begin{array}{r} 25 \\ \times 2 \end{array}$    O.  $\begin{array}{r} 25 \\ \times 3 \end{array}$    P.  $\begin{array}{r} 25 \\ \times 4 \end{array}$

R.  $\begin{array}{r} 25 \\ \times 5 \end{array}$    S.  $\begin{array}{r} 25 \\ \times 6 \end{array}$    T.  $\begin{array}{r} 25 \\ \times 7 \end{array}$    U.  $\begin{array}{r} 25 \\ \times 10 \end{array}$    W.  $\begin{array}{r} 25 \\ \times 100 \end{array}$    Y.  $\begin{array}{r} 25 \\ \times 200 \end{array}$

## GETTING STARTED

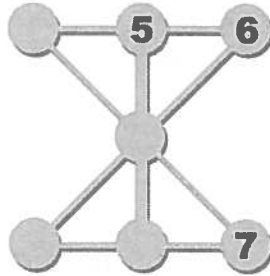


Work together with your classmates, using your *MATHPOWER*<sup>TM</sup> student text, pages 2 and 3.



## Warm Up



- Place the numbers from 1 to 4 in the circles, so that the numbers in each row, column, and diagonal add up to 12.



- How many times will you see the digit 8 in the numbers from 1 to 50?
- Fill in the blanks to make the statement true.

$$\begin{array}{r}
 \phantom{+} \phantom{E} \phantom{\square} \phantom{\square} \phantom{V} \phantom{E} \phantom{N} \\
 + \phantom{E} \phantom{\square} \phantom{\square} \phantom{V} \phantom{E} \phantom{N} \\
 \hline
 \phantom{E} \phantom{\square} \phantom{\square} \phantom{\square} \phantom{\square} \phantom{E} \phantom{E} \phantom{N}
 \end{array}$$

- Which number has its letters in alphabetical order?  
 a) four    b) eight    c) sixty    d) forty    e) fifty
- List 6 different ways you can make 50¢, using nickels, dimes, and quarters.

Nickels (5¢)	Dimes (10¢)	Quarters (25¢)	Total 50¢
			✓ yes

**Challenge Yourself!**  
Are there more ways?

## Mental Math



NO CALCULATOR

Add.

1. 
$$\begin{array}{r} 15 \\ + 12 \\ \hline \end{array}$$

2. 
$$\begin{array}{r} 24 \\ + 11 \\ \hline \end{array}$$

3. 
$$\begin{array}{r} 22 \\ + 37 \\ \hline \end{array}$$

4. 
$$\begin{array}{r} 14 \\ + 15 \\ \hline \end{array}$$

5. 
$$\begin{array}{r} 20 \\ + 43 \\ \hline \end{array}$$

6. 
$$\begin{array}{r} 27 \\ + 50 \\ \hline \end{array}$$

Subtract.

7. 
$$\begin{array}{r} 20 \\ - 13 \\ \hline \end{array}$$

8. 
$$\begin{array}{r} 30 \\ - 21 \\ \hline \end{array}$$

9. 
$$\begin{array}{r} 40 \\ - 22 \\ \hline \end{array}$$

10. 
$$\begin{array}{r} 50 \\ - 33 \\ \hline \end{array}$$

11. 
$$\begin{array}{r} 22 \\ - 11 \\ \hline \end{array}$$

12. 
$$\begin{array}{r} 34 \\ - 13 \\ \hline \end{array}$$

Multiply.

13.  $3 \times 9 = \underline{\hspace{2cm}}$

14.  $2 \times 9 = \underline{\hspace{2cm}}$

15.  $3 \times 8 = \underline{\hspace{2cm}}$

16.  $9 \times 0 = \underline{\hspace{2cm}}$

17.  $8 \times 10 = \underline{\hspace{2cm}}$

18.  $2 \times 7 = \underline{\hspace{2cm}}$

19.  $9 \times 10 = \underline{\hspace{2cm}}$

20.  $7 \times 3 = \underline{\hspace{2cm}}$

21.  $2 \times 6 = \underline{\hspace{2cm}}$

22.  $3 \times 6 = \underline{\hspace{2cm}}$

23.  $5 \times 6 = \underline{\hspace{2cm}}$

24.  $4 \times 4 = \underline{\hspace{2cm}}$

Divide.

25.  $3 \overline{)63}$

26.  $2 \overline{)22}$

27.  $9 \overline{)90}$

28.  $10 \overline{)90}$

29.  $6 \overline{)72}$

30.  $8 \overline{)96}$

31.  $10 \overline{)130}$

32.  $9 \overline{)99}$

33.  $10 \overline{)200}$

34.  $10 \overline{)150}$

35.  $8 \overline{)80}$

36.  $7 \overline{)84}$

## Skill Builder



NO CALCULATOR

1. Solve.

a) 
$$\begin{array}{r} 247 \\ + 654 \\ \hline \end{array}$$

b) 
$$\begin{array}{r} 300 \\ - 162 \\ \hline \end{array}$$

c) 
$$\begin{array}{r} 46 \\ \times 23 \\ \hline \end{array}$$

d)  $4 \overline{)879}$

2. What is the next number?

a) 577, 578, 579, \_\_\_\_\_

b) 56.4, 56.5, 56.6, \_\_\_\_\_

c) 82, 81, 80, \_\_\_\_\_

d) 2.9, 2.8, 2.7, \_\_\_\_\_

e) 5.3, 5.4, 5.5, \_\_\_\_\_

f) 67, 68, 69, \_\_\_\_\_

# 1.1 Choosing a Calculation Method

**Exact Answer:** There are 2 deer on the road.

**Approximate Answer:** The park had about 2000 visitors yesterday.

## Problems and Applications

1. Tell whether you need an *exact* answer or an *approximate* answer.

- a) How long will it take you to cut the grass? \_\_\_\_\_
- b) How many buses will our school need to go on a field trip? \_\_\_\_\_
- c) How much money will you need to go to Calgary? \_\_\_\_\_
- d) You are buying hot dogs to sell at a basketball tournament. How many should you buy? \_\_\_\_\_
- e) You are a driver of a car. What time will you arrive in Vancouver? \_\_\_\_\_
- f) What time does the movie start? \_\_\_\_\_
- g) How many hamburgers will a one-litre bottle of ketchup cover? \_\_\_\_\_
- h) How many hours do you sleep in one week? \_\_\_\_\_

2. Match the *best* calculation method to each of the following problems.

- |                                      |       |  |
|--------------------------------------|-------|--|
| a) Estimating<br>(an educated guess) | _____ | You keep score at a basketball game.   |
| b) Calculators                       | _____ | $\$3289.79 + \$789.33 = ?$   |
| c) Paper-and-pencil                  | _____ | How many litres of paint will I need to paint your room?                     |
| d) Mental Math                       | _____ | I have 80¢. How much do I still need to buy a fruit drink that costs \$1.00? |

4. Complete each table.

a)

5	8
4	7
7	10
6	
9	

b)

7	6
9	8
4	3
8	
5	

c)

2	6
4	12
5	15
6	
7	

d)

10	5
12	6
8	4
6	
4	

**Pattern:**

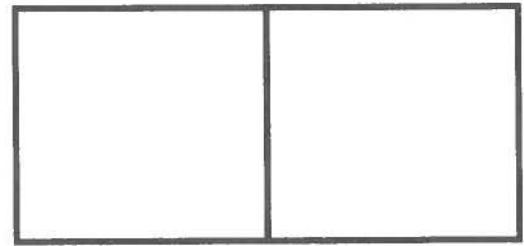
Add \_\_\_\_\_.

Subtract \_\_\_\_\_.

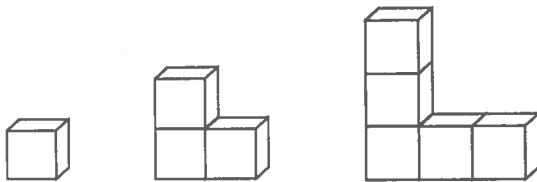
\_\_\_\_\_

\_\_\_\_\_

5. Draw the next 2 figures.



6. How many cubes are in the 6th diagram?



**1**  
1 cube

**2**  
3 cubes

**3**  
\_\_\_ cubes

**4**  
\_\_\_ cubes

**5**  
\_\_\_ cubes

**6**  
\_\_\_ cubes

Draw the 6th diagram.

**Sentence:** \_\_\_\_\_







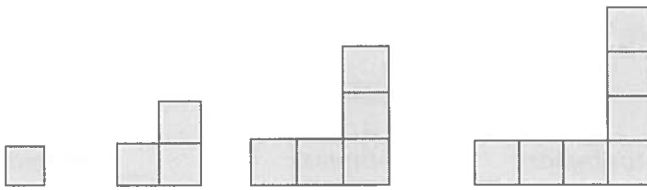
Complete the table.

×	1	3	5	7
2			10	14
4		12		
6	6			
8				56

### Skill Builder

1. Draw the next 2 figures.

a)



b)



2. Solve.

a)  $5 + 4 =$  \_\_\_\_\_

b)  $5 + 14 =$  \_\_\_\_\_

c)  $13 - 7 =$  \_\_\_\_\_

d)  $23 - 7 =$  \_\_\_\_\_

3. Multiply.

a)  $6 \times 2 =$  \_\_\_\_\_

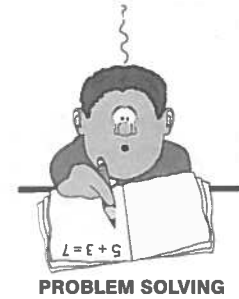
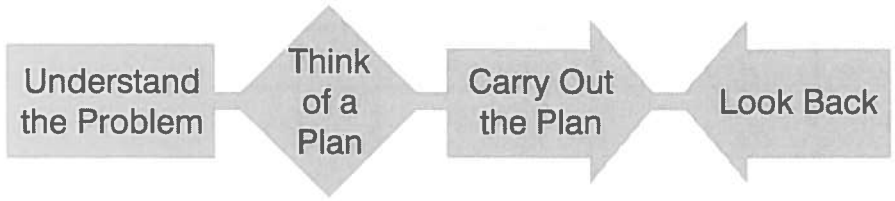
b)  $6 \times 20 =$  \_\_\_\_\_

c)  $6 \times 200 =$  \_\_\_\_\_

d)  $6 \times 2000 =$  \_\_\_\_\_



# 1.2 Problem Solving: Look for a Pattern



## Problems and Applications

1. Draw the next two flowers.



2 petals



4 petals



\_\_\_ petals



\_\_\_ petals

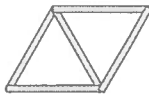
\_\_\_ petals

2. How many toothpicks are in the 8th diagram?



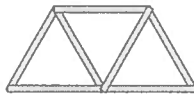
1

3 toothpicks



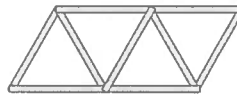
2

5 toothpicks



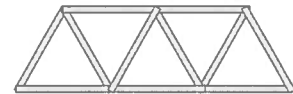
3

\_\_\_ toothpicks



4

\_\_\_ toothpicks



5

\_\_\_ toothpicks

Pattern: 3, 5, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Sentence: \_\_\_\_\_

3. Look for a pattern, then name the next 3 numbers.

a) 1, 3, 5, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

b) 3, 6, 9, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

c) 22, 20, 18, 16, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

d) 35, 30, 25, 20, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

e) 4, 5, 7, 10, 14, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

f) 2, 6, 18, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

g) 200 000, 20 000, 2000, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_



# 1.3 Place Value

TRILLIONS	HUNDRED BILLIONS	TEN BILLIONS	BILLIONS	HUNDRED MILLIONS	TEN MILLIONS	MILLIONS	HUNDRED THOUSANDS	TEN THOUSANDS	THOUSANDS	HUNDREDS	TENS	ONES	AND	TENTHS	HUNDREDTHS	THOUSANDTHS
									6	0	3	5	.	7	2	6

SIX THOUSAND THIRTY-FIVE AND SEVEN HUNDRED TWENTY-SIX THOUSANDTHS

## Practice

1. Write each number in words.

a) 12 = \_\_\_\_\_

b) 35 = \_\_\_\_\_

c) 64 = \_\_\_\_\_

d) 89 = \_\_\_\_\_

e) 125 = \_\_\_\_\_

f) 689 = \_\_\_\_\_

g) 4210 = four thousand two hundred ten

h) 84 308 = \_\_\_\_\_

i) 528 463 = \_\_\_\_\_

j) 2 000 000 000 = \_\_\_\_\_

k) 0.3 = \_\_\_\_\_

l) 6.78 = \_\_\_\_\_

m) 26.7 = \_\_\_\_\_

n) 45.784 = \_\_\_\_\_

o) 100.58 = \_\_\_\_\_

- p) 225.78 = \_\_\_\_\_
- q) 480.38 = \_\_\_\_\_
- r) 2030.4 = \_\_\_\_\_
- s) 5729.21 = \_\_\_\_\_
- t) 12 346.142 = \_\_\_\_\_

2. A calculator **does not** use **spaces** between groups of three numbers. Write each number using spaces.




- |  |  |
|--|--|
| a) <span style="border: 1px solid black; padding: 2px;">6493000</span> _____   | b) <span style="border: 1px solid black; padding: 2px;">2916.21</span> _____   |
| c) <span style="border: 1px solid black; padding: 2px;">456138</span> _____    | d) <span style="border: 1px solid black; padding: 2px;">34896.111</span> _____ |
| e) <span style="border: 1px solid black; padding: 2px;">628476941</span> _____ | f) <span style="border: 1px solid black; padding: 2px;">48936.5</span> _____   |
| g) <span style="border: 1px solid black; padding: 2px;">729386</span> _____    | h) <span style="border: 1px solid black; padding: 2px;">26789314</span> _____  |

3. Write the **total value** of the underlined digit in each number.


- a) 2374.56 = three hundred \_\_\_\_\_
- b) 2891.6 = \_\_\_\_\_
- c) 2893 = \_\_\_\_\_
- d) 120 394 = \_\_\_\_\_
- e) 67.39 = nine hundredths \_\_\_\_\_
- f) 0.234 = \_\_\_\_\_
- g) 893.456 = \_\_\_\_\_
- h) 62.713 = \_\_\_\_\_
- i) 427 063 = \_\_\_\_\_
- j) 28 932 = \_\_\_\_\_
- k) 1 345 787 = \_\_\_\_\_

4. Write each number in standard form.

- a) two thousand eight hundred twelve = 2812
- b) three thousand six hundred = \_\_\_\_\_
- c) seventy-three million = \_\_\_\_\_
- d) four hundred thirty-three = \_\_\_\_\_
- e) five hundred forty-five thousand = \_\_\_\_\_
- f) two thousand three hundred forty = \_\_\_\_\_
- g) seventy and forty-three hundredths = 70.43
- h) thirty-eight and fifty-seven hundredths = \_\_\_\_\_
- i) two hundred and eighteen hundredths = \_\_\_\_\_
- j) seven tenths = \_\_\_\_\_
- k) eight and sixty-eight thousandths = \_\_\_\_\_



Expanded Form



Standard Form

**Example 1:**  $3000 + 400 + 80 + 6 = 3486$   
 $(3 \times 1000) + (4 \times 100) + (8 \times 10) + (6 \times 1) = 3486$

**Example 2:**  $(6 \times 100) + (4 \times 10) + (2 \times 1) + (6 \times 0.01) = 642.06$

5. Write in standard form.

- a)  $3000 + 400 + 80 + 6 =$  \_\_\_\_\_
- b)  $7000 + 800 + 90 + 3 =$  \_\_\_\_\_
- c)  $60\ 000 + 4000 + 900 + 30 + 2 =$  \_\_\_\_\_
- d)  $(9 \times 1000) + (5 \times 100) + (7 \times 10) =$  \_\_\_\_\_
- e)  $(5 \times 10\ 000) + (2 \times 1000) + (3 \times 100) + (6 \times 10) + (9 \times 1) =$  \_\_\_\_\_
- f)  $(8 \times 1) + (6 \times 0.1) + (9 \times 0.01) =$  \_\_\_\_\_



g)  $(3 \times 10) + (4 \times 0.1) + (2 \times 0.01) + (9 \times 0.001) =$  \_\_\_\_\_

h)  $400 + 20 + 3 + 0.5 + 0.07 =$  \_\_\_\_\_

i)  $(5 \times 1000) + (6 \times 100) + (4 \times 10) + (3 \times 1) + (2 \times 0.1) =$  \_\_\_\_\_

6. Write in expanded form.

a)  $567 =$  \_\_\_\_\_

b)  $2400 =$  \_\_\_\_\_

c)  $82\,391 =$  \_\_\_\_\_

d)  $382\,034 =$  \_\_\_\_\_

e)  $716\,948 =$  \_\_\_\_\_

f)  $7.29 =$  \_\_\_\_\_

g)  $45.364 =$  \_\_\_\_\_

h)  $82.034 =$  \_\_\_\_\_

i)  $398.2 =$  \_\_\_\_\_

j)  $4782.91 =$  \_\_\_\_\_



## Problems and Applications

7. Write each number in words.

a) A painting sold for \$39 987.

\_\_\_\_\_

b) Canada has at least 1 000 000 hockey fans. \_\_\_\_\_

c) Susan had 1257 baseball cards.

\_\_\_\_\_

d) There are 3 175 286 different kinds of beetles in the world.

\_\_\_\_\_

e) A total of 57 642 fans attended the soccer game.

\_\_\_\_\_



The final score in a soccer game was 3-3. How many possible half-time scores were there?  
 (Remember, no team can have more than 3 points.)



Possible Half-Time Scores

0-0	1-0	2-0	3-0
0-1	1-1	2-1	
0-2			

There are \_\_\_\_\_ possible half-time scores.

### Skill Builder

1. Place each set of numbers on the number line.

a) 5.6, 5.3, 5.1, 5.7, 5.9



b) 0.25, 0.28, 0.27, 0.30



2. Reorder each set of numbers from smallest to largest.

a) 5.6, 5.3, 5.1, 5.7, 5.9 \_\_\_\_\_

b) 0.25, 0.28, 0.2, 0.27, 0.29 \_\_\_\_\_

3. Fill in the blanks.

a)  $91 + \underline{\hspace{2cm}} = 100$       b)  $84 + \underline{\hspace{2cm}} = 100$       c)  $71 + \underline{\hspace{2cm}} = 100$

d)  $92 + \underline{\hspace{2cm}} = 100$       e)  $82 + \underline{\hspace{2cm}} = 100$       f)  $72 + \underline{\hspace{2cm}} = 100$



# 1.4 Rounding Numbers: Mental Math

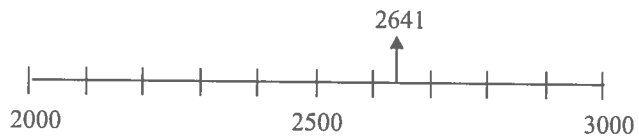


- Step 1: Find the rounding place.
- Step 2: Look at the digit to the right.
- Step 3: Compare this digit to 5.
- Step 4: Write the rounded number.

Example 1: Round 2641 to the nearest thousand.

2641

The digit is greater than 5. Add 1 to the circled digit.

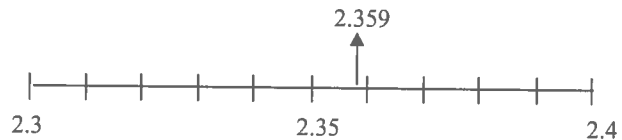


Answer: 3000

Example 2: Round 2.359 to the nearest tenth.

2.359

The digit is 5. Add 1 to the circled digit.

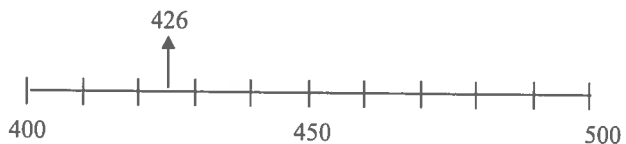


Answer: 2.4

Example 3: Round 426 to the nearest hundred.

426

The digit is less than 5. Keep the circled digit the same.

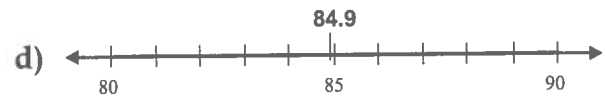
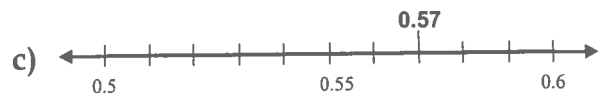
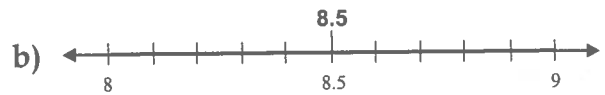
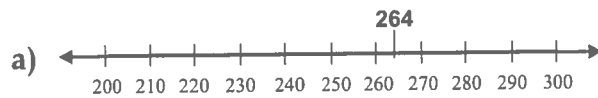


Answer: 400



## Practice

1. Circle the end of the line to which the highlighted number is closest.



2. Round to the nearest *ten*.

a) 26 \_\_\_\_\_

b) 74 \_\_\_\_\_

c) 142 \_\_\_\_\_

d) 201 \_\_\_\_\_

e) 1265 \_\_\_\_\_

f) 374 \_\_\_\_\_

g) 6324 \_\_\_\_\_

h) 505 \_\_\_\_\_

i) 219 \_\_\_\_\_



3. Round to the nearest *hundred*.

a) 862 \_\_\_\_\_

b) 942 \_\_\_\_\_

c) 658 \_\_\_\_\_

d) 2432 \_\_\_\_\_

e) 957 \_\_\_\_\_

f) 4669 \_\_\_\_\_

g) 10 458 \_\_\_\_\_

h) 12 991 \_\_\_\_\_

i) 21 698 \_\_\_\_\_

4. Round to the nearest *thousand*.

a) 3417 \_\_\_\_\_

b) 6814 \_\_\_\_\_

c) 39 600 \_\_\_\_\_

d) 43 578 \_\_\_\_\_

e) 57 209 \_\_\_\_\_

f) 24 560 \_\_\_\_\_

g) 23 184 \_\_\_\_\_

h) 38 967 \_\_\_\_\_

i) 29 721 \_\_\_\_\_

5. Round to the nearest *ten thousand*.

a) 34 456 \_\_\_\_\_

b) 68 900 \_\_\_\_\_

c) 85 200 \_\_\_\_\_

d) 203 000 \_\_\_\_\_

e) 707 000 \_\_\_\_\_

f) 605 111 \_\_\_\_\_

g) 219 112 \_\_\_\_\_

h) 123 456 \_\_\_\_\_

i) 789 200 \_\_\_\_\_

6. Round to the stated place value.

- a) 450 000 (hundred thousand) \_\_\_\_\_ b) 36 400 000 (million) \_\_\_\_\_  
c) 7 900 000 (million) \_\_\_\_\_ d) 45 000 000 (ten million) \_\_\_\_\_  
e) 23 600 000 000 (billion) \_\_\_\_\_

7. Round to the nearest *tenth*.

- a) 0.46 \_\_\_\_\_ b) 2.525 \_\_\_\_\_ c) 76.55 \_\_\_\_\_  
d) 0.066 \_\_\_\_\_ e) 13.233 \_\_\_\_\_ f) 1.057 \_\_\_\_\_

8. Round to the nearest *hundredth*.

- a) 0.567 \_\_\_\_\_ b) 1.202 \_\_\_\_\_ c) 56.785 \_\_\_\_\_  
d) 3.406 \_\_\_\_\_ e) 33.335 \_\_\_\_\_ f) 0.452 \_\_\_\_\_

9. Round to the nearest *thousandth*.

- a) 0.3472 \_\_\_\_\_ b) 7.8065 \_\_\_\_\_ c) 66.5678 \_\_\_\_\_

10. What digit could you replace \_\_\_ with so that

a) 8\_\_5 rounds to 900?

There is more than



one right answer.

b) 3\_\_66 rounds to 3000?

c) 1.7\_\_6 rounds to 1.8?

d) 21.54\_\_ rounds to 21.54?

## Problems and Applications

Rewrite the following radio news stories. Use exact or rounded numbers.

11. Yesterday, Raisa, the zoo's popular tiger, gave birth to three cubs. Their masses were 4.1 kg, 4.2 kg, and 5.4 kg.

---

---

12. The Broadway show *Dancing Fool* had 731 performances and ticket sales of \$1 235 678.50.

---

---

## Skill Builder



1. Round each number to the place value in brackets.

a) 689 (ten) \_\_\_\_\_

b) 8910 (thousand) \_\_\_\_\_

c) 1472 (hundred) \_\_\_\_\_

d) 175.468 (hundredth) \_\_\_\_\_

e) 99.89 (tenth) \_\_\_\_\_

2. Solve.

a)  $2 \times 4 =$  \_\_\_\_\_

b)  $20 \times 4 =$  \_\_\_\_\_

c)  $20 \times 40 =$  \_\_\_\_\_

d)  $10 \times 7 =$  \_\_\_\_\_

e)  $100 \times 7 =$  \_\_\_\_\_

f)  $100 \times 70 =$  \_\_\_\_\_

g)  $5 + 15 =$  \_\_\_\_\_

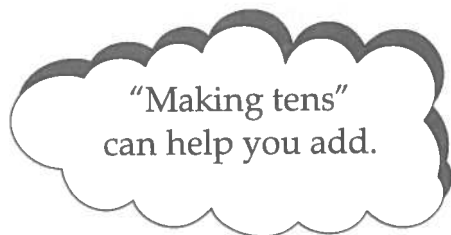
h)  $5 + 15 + 6 =$  \_\_\_\_\_

i)  $5 + 25 + 2 =$  \_\_\_\_\_



NO CALCULATOR

3.



Circle the pairs  
that total 10.

6	1	7	3	5
2	4	8	9	5

a)  $\begin{array}{r} 14 \\ + 36 \\ \hline \end{array}$

b)  $\begin{array}{r} 21 \\ + 19 \\ \hline \end{array}$

c)  $\begin{array}{r} 40 \\ + 60 \\ \hline \end{array}$

d)  $\begin{array}{r} 32 \\ + 18 \\ \hline \end{array}$

e)  $\begin{array}{r} 21 \\ + 9 \\ \hline \end{array}$

f)  $\begin{array}{r} 33 \\ + 7 \\ \hline \end{array}$

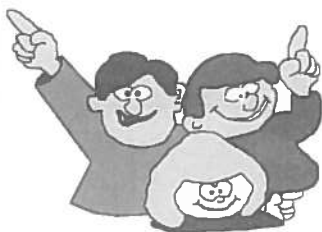
g)  $\begin{array}{r} 32 \\ + 38 \\ \hline \end{array}$

h)  $\begin{array}{r} 56 \\ + 94 \\ \hline \end{array}$

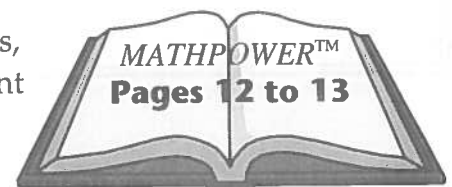
i)  $\begin{array}{r} 65 \\ + 15 \\ \hline \end{array}$

j)  $\begin{array}{r} 22 \\ + 18 \\ \hline \end{array}$

## LEARNING TOGETHER Exploring Mental Math



Work together with your classmates, using your **MATHPOWER™** student text, pages 12 and 13.



## Skill Builder

1. Write "is less than," "is more than," or "is equal to" between each pair of numbers.

a) 1001 \_\_\_\_\_ 1010

b) 5.4 \_\_\_\_\_ 0.54

c) 4.8 \_\_\_\_\_ 4.80

d) 200.9 \_\_\_\_\_ 200.10

e) 6.44 \_\_\_\_\_ 6.45

2. Circle the larger number in each of the following.

a) 4.8 or 4.6

b) 56.89 or 56.78

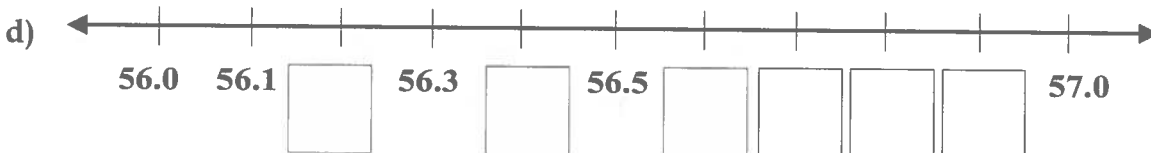
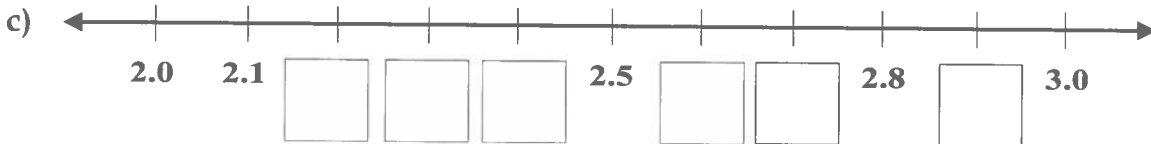
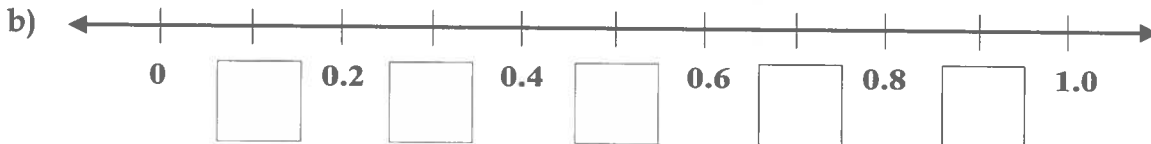
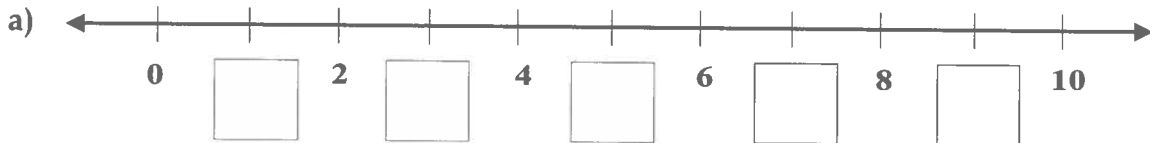
c) 10 000.001 or 10.1

d) 29.01 or 29.001

e) 3.56 or 3.65

f) 23.323 or 233.23

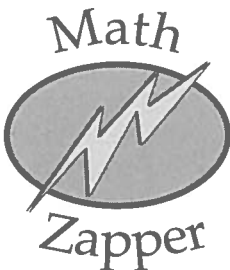
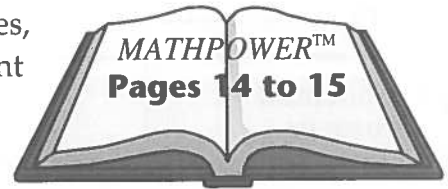
3. Complete the number lines.



# LEARNING TOGETHER Comparing and Ordering Numbers



Work together with your classmates, using your *MATHPOWER*<sup>™</sup> student text, pages 14 and 15.

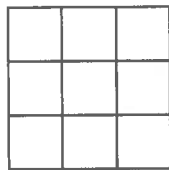


Which whole number is greater:  
a) the 40th even number, or  
b) the 10th number ending in 5?



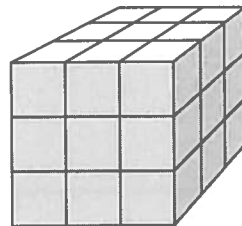
## Skill Builder

1. Fill in the blanks.



$3 \times 3$  square

Area = \_\_\_\_\_



$3 \times 3 \times 3$  cube

Volume = \_\_\_\_\_

2. Multiply.

a)  $2 \times 2 =$  \_\_\_\_\_

b)  $2 \times 2 \times 2 =$  \_\_\_\_\_

c)  $2 \times 2 \times 2 \times 2 =$  \_\_\_\_\_

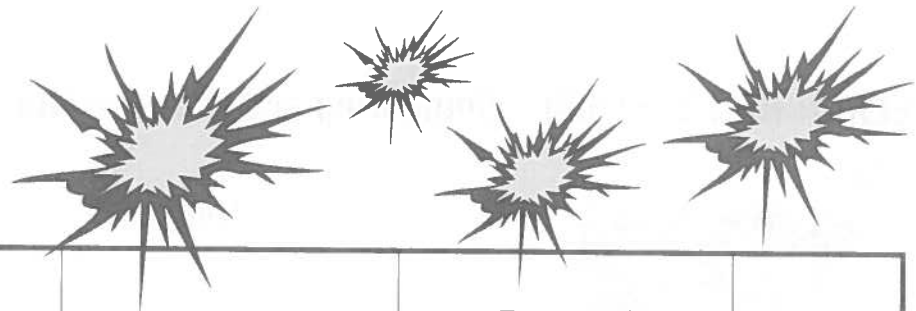
d)  $3 \times 3 =$  \_\_\_\_\_

e)  $3 \times 3 \times 3 =$  \_\_\_\_\_

f)  $3 \times 3 \times 3 \times 3 =$  \_\_\_\_\_



# 1.5 Exponents



Complete the chart.

Exponential Form or Power	Base	Exponent	Word Description	Repeated Multiplication	Standard Form
$3^2$	3	2	three squared	$3 \times 3$	9
$2^4$			two to the exponent four		
				$6 \times 6 \times 6 \times 6 \times 6$	
$10^3$			ten cubed		
				$2 \times 2 \times 2 \times 2 \times 2 \times 2$	
	6	2			
				$4 \times 4 \times 4$	

## Practice

1. Write the exponent.

- a)  $4^5$  \_\_\_\_\_      b)  $10^5$  \_\_\_\_\_      c)  $7^3$  \_\_\_\_\_      d)  $9^2$  \_\_\_\_\_  
 e)  $2^9$  \_\_\_\_\_      f)  $25^{11}$  \_\_\_\_\_      g)  $20^8$  \_\_\_\_\_      h)  $8^6$  \_\_\_\_\_

2. Write the base.

- a)  $4^2$  \_\_\_\_\_      b)  $3^5$  \_\_\_\_\_      c)  $10^5$  \_\_\_\_\_      d)  $5^3$  \_\_\_\_\_  
 e)  $6^3$  \_\_\_\_\_      f)  $2^{12}$  \_\_\_\_\_      g)  $6^{16}$  \_\_\_\_\_      h)  $7^4$  \_\_\_\_\_

3. Write as repeated multiplication.

a)  $5^2 = \underline{\quad} \times \underline{\quad}$

b)  $10^5 = \underline{\quad} \times \underline{\quad} \times \underline{\quad} \times \underline{\quad} \times \underline{\quad}$

c)  $12^6 = \underline{\hspace{2cm}}$

d)  $20^3 = \underline{\hspace{2cm}}$

e)  $8^3 = \underline{\hspace{2cm}}$

f)  $9^7 = \underline{\hspace{2cm}}$

g)  $2^3 = \underline{\hspace{2cm}}$

h)  $4^5 = \underline{\hspace{2cm}}$

4. Write in exponential form.

a)  $2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^{\square}$

b)  $10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 = \underline{\hspace{2cm}}$

c)  $5 \times 5 \times 5 \times 5 \times 5 = \underline{\hspace{2cm}}$

d)  $3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 = \underline{\hspace{2cm}}$

e)  $6 \times 6 = \underline{\hspace{2cm}}$

f)  $9 \times 9 \times 9 \times 9 = \underline{\hspace{2cm}}$

5. Complete the chart.

	Standard Form	Power of 10
a)	100	$10^{\square}$
b)	10 000	
c)	10	
d)	1000	
e)	1 000 000	
f)	100 000	
g)	10 000 000	$10^7$
h)	10 000 000 000	

$10^5 = 100\ 000$

$10^5 = 10 \times 10 \times 10 \times 10 \times 10$



6. Write in standard form.

a)  $3 \times 3 \times 3 = \underline{\hspace{2cm}}$

b)  $8 \times 8 \times 8 = \underline{\hspace{2cm}}$

c)  $6 \times 6 \times 6 \times 6 = \underline{\hspace{2cm}}$

d)  $5 \times 5 \times 5 = \underline{\hspace{2cm}}$

e)  $2 \times 2 = \underline{\hspace{2cm}}$

f)  $4 \times 4 \times 4 \times 4 = \underline{\hspace{2cm}}$

7. Write in standard form.



- a)  $2^4 =$  \_\_\_\_\_      b)  $3^2 =$  \_\_\_\_\_      c)  $4^5 =$  \_\_\_\_\_      d)  $8^3 =$  \_\_\_\_\_  
 e)  $9^3 =$  \_\_\_\_\_      f)  $7^4 =$  \_\_\_\_\_      g)  $5^5 =$  \_\_\_\_\_      h)  $8^4 =$  \_\_\_\_\_  
 i)  $6^3 =$  \_\_\_\_\_      j)  $2^{10} =$  \_\_\_\_\_      k)  $3^4 =$  \_\_\_\_\_      l)  $4^4 =$  \_\_\_\_\_

8. Complete the table.

	Power	Base	Exponent	Standard Form
a)	$3^5$			243
b)		10	4	
c)	$2^6$	2		
d)	$4^3$			64
e)	_____ <sup>3</sup>			125

## Problems and Applications

9. Write the powers in order from smallest to largest.

Smallest to Largest

a)  $3^4$ ,  $4^3$ ,  $2^5$ ,  $5^2$

↓       ↓       ↓       ↓

81			
----	--	--	--

$5^2$ , \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

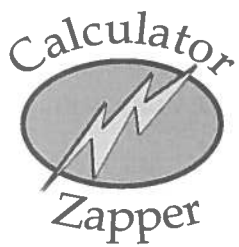
b)  $8^3$ ,  $5^4$ ,  $6^3$ ,  $4^6$

↓       ↓       ↓       ↓

--	--	--	--

\_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_





Some calculators have an exponent key.

To calculate  $2^3$ , press **C** 2 **X<sup>y</sup>** 3 **=**

The answer is .

1. Use your calculator and solve.

a)  $5^3 =$  \_\_\_\_\_      b)  $3^5 =$  \_\_\_\_\_      c)  $2^8 =$  \_\_\_\_\_

d)  $3^4 =$  \_\_\_\_\_      e)  $10^6 =$  \_\_\_\_\_      f)  $12^4 =$  \_\_\_\_\_

2. Circle the larger number.

a)  $2^6$  or  $6^2$       b)  $3^4$  or  $4^3$       c)  $10^2$  or  $2^{10}$       d)  $5^3$  or  $3^5$

or

or

or

or

## Skill Builder

1. Complete the table.

	Power	Repeated Multiplication	Standard Form
a)	$10^2$	$10 \times 10$	
b)		$10 \times 10 \times 10$	1000
c)	$10^4$		

2. Multiply.

a)  $5.1 \times 10 =$  \_\_\_\_\_      b)  $5.1 \times 100 =$  \_\_\_\_\_      c)  $5.1 \times 1000 =$  \_\_\_\_\_

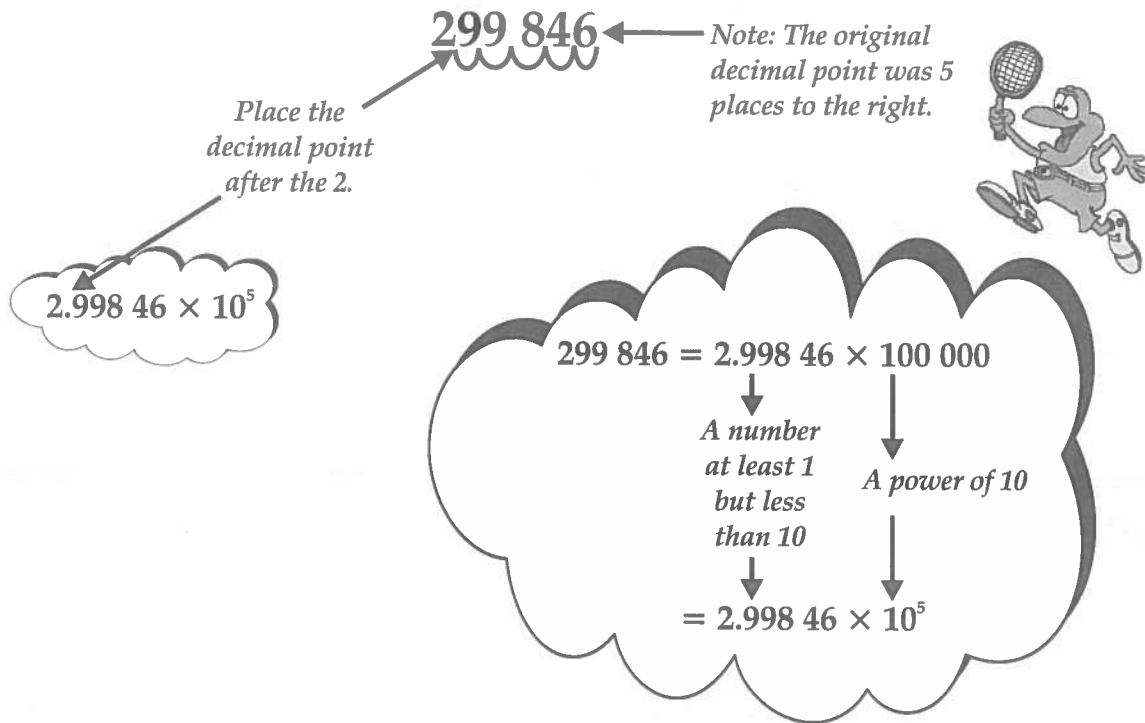
d)  $0.32 \times 10 =$  \_\_\_\_\_      e)  $0.32 \times 100 =$  \_\_\_\_\_      f)  $0.32 \times 1000 =$  \_\_\_\_\_

g)  $4.7 \times 10 =$  \_\_\_\_\_      h)  $0.085 \times 100 =$  \_\_\_\_\_      i)  $9.65 \times 1000 =$  \_\_\_\_\_

# 1.6 Scientific Notation

Standard Form	Product Form	Scientific Notation
385	$3.85 \times 100$	$3.85 \times 10^2$
3850	$3.85 \times 1000$	$3.85 \times 10^3$
38 500	$3.85 \times 10\ 000$	$3.85 \times 10^4$
385 000	$3.85 \times 100\ 000$	

To write a number in scientific notation:



## Practice

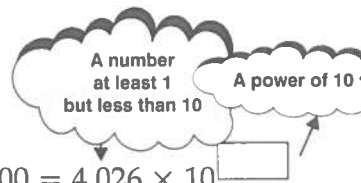
1. Complete the tables.

a)

Standard Form	Scientific Notation
65	$6.5 \times 10^1$
650	$6.5 \times 10^{\square}$
6500	
65 000	
650 000	

b)

Standard Form	Scientific Notation
	$5.92 \times 10$
592	$5.92 \times 10^2$
	$5.92 \times 10^3$
	$5.92 \times 10^4$
	$5.92 \times 10^5$



2. Find the value of each .

a)  $6600 = 6.6 \times 10^{\text{$

c)  $35.1 = 3.51 \times 10^{\text{$

e)  $542.8 = 5.428 \times 10^{\text{$

g)  $30\,294.2 = 3.029\,42 \times 10^{\text{$

b)  $4\,026\,000 = 4.026 \times 10^{\text{$

d)  $22\,600 = 2.26 \times 10^{\text{$

f)  $398.5 = 3.985 \times 10^{\text{$

h)  $300\,000 = 3 \times 10^{\text{$

3. Find the value of each blank.

a)  $75\,000 = \underline{7.5} \times 10^4$

c)  $920 = \underline{\hspace{2cm}} \times 10^2$

e)  $52 = \underline{\hspace{2cm}} \times 10^1$

g)  $179 = \underline{\hspace{2cm}} \times 10^2$

b)  $1\,850\,000 = \underline{\hspace{2cm}} \times 10^6$

d)  $1430 = \underline{\hspace{2cm}} \times 10^3$

f)  $35\,900 = \underline{\hspace{2cm}} \times 10^4$

h)  $59\,673 = \underline{\hspace{2cm}} \times 10^4$

4. Write each number in scientific notation.

a)  $1470 = \underline{1.47 \times 10^3}$

c)  $99 = \underline{\hspace{2cm}}$

e)  $33\,650 = \underline{3.365 \times 10^{\text{$

g)  $1489.2 = \underline{\hspace{2cm}}$

i)  $128 = \underline{\hspace{2cm}}$

b)  $288\,000 = \underline{\hspace{2cm}}$

d)  $1489 = \underline{\hspace{2cm}}$

f)  $29\,700 = \underline{\hspace{2cm}}$

h)  $145.6 = \underline{\hspace{2cm}}$

j)  $38 = \underline{\hspace{2cm}}$

5. Write each number in standard form.

a)  $7.206 \times 10^5 = \underline{720\,600}$

c)  $9.9 \times 10^3 = \underline{\hspace{2cm}}$

e)  $6.3 \times 10^5 = \underline{\hspace{2cm}}$

g)  $2.9 \times 10^2 = \underline{\hspace{2cm}}$

i)  $3.928 \times 10^6 = \underline{\hspace{2cm}}$

b)  $3 \times 10^2 = \underline{\hspace{2cm}}$

d)  $1.003 \times 10^6 = \underline{\hspace{2cm}}$

f)  $7.33 \times 10^4 = \underline{\hspace{2cm}}$

h)  $14 \times 10^3 = \underline{\hspace{2cm}}$

j)  $3.29 \times 10 = \underline{\hspace{2cm}}$

## Problems and Applications

6. Write each number in the following problems in *standard form*.

- a) The total area of the province of British Columbia is  $9.478 \times 10^5$  km<sup>2</sup>. Its coastline is  $1.7856 \times 10^4$  km long.
- 

- b) The Commonwealth Stadium in Edmonton, Alberta, has a seating capacity of  $6.0081 \times 10^4$ .
- 

- c) The sun is  $1.5 \times 10^8$  km away from Earth. \_\_\_\_\_

7. Write each number in the following problems in *scientific notation*.

- a) One year, about 489 000 people in Manitoba voted in the federal election.

\_\_\_\_\_ 489 000 = \_\_\_\_\_

- b) One year, the population of Metropolitan Vancouver, British Columbia, was 1 603 000.
- 

- c) The altitude of Calgary, Alberta, is 1045 m. \_\_\_\_\_

- d) The distance between Edmonton and Calgary is 248 km. \_\_\_\_\_



Find each pattern. Fill in the missing numbers.



## Skill Builder

1. *Guess my number.*

- It is less than 50.
- It is greater than 25.
- It is a multiple of 5.
- It is a multiple of 10.



My number is \_\_\_\_\_ or \_\_\_\_\_.

2. *Calculate.*

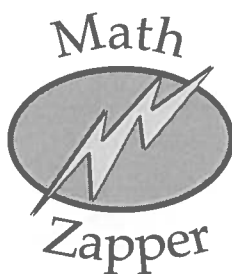
a)  $\begin{array}{r} 17 \\ + 3 \\ \hline \end{array}$     b)  $\begin{array}{r} 27 \\ + 13 \\ \hline \end{array}$     c)  $\begin{array}{r} 58 \\ - 8 \\ \hline \end{array}$     d)  $\begin{array}{r} 58 \\ - 28 \\ \hline \end{array}$     e)  $\begin{array}{r} 82 \\ - 2 \\ \hline \end{array}$



NO CALCULATOR

Watch your signs!

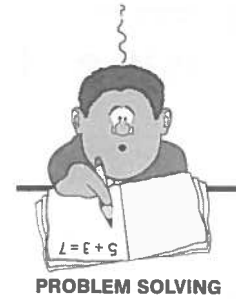
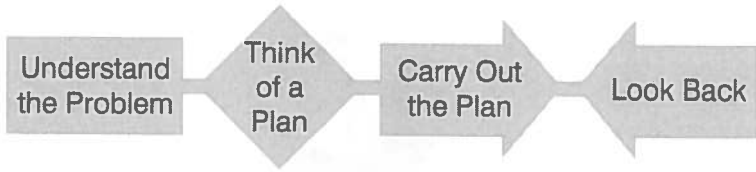
f)  $\begin{array}{r} 82 \\ - 32 \\ \hline \end{array}$     g)  $\begin{array}{r} 42 \\ + 8 \\ \hline \end{array}$     h)  $\begin{array}{r} 42 \\ + 28 \\ \hline \end{array}$     i)  $\begin{array}{r} 25 \\ + 5 \\ \hline \end{array}$     j)  $\begin{array}{r} 25 \\ + 65 \\ \hline \end{array}$



Michelle has 6 coins worth \$2.50. What coins might she have?



# 1.7 Problem Solving: Guess and Check



## Problems and Applications

1. The sum of two numbers is 9. Their product is 20. What are the numbers?

Facts: Sum of the two numbers is \_\_\_\_\_

Sum  
→ add  
Product  
→ multiply

Product is \_\_\_\_\_

GUESS		CHECK		CHECK
Numbers	Sum (+)	Does total = 9?	Product (×)	Does product = 20?
3 and 3	$3 + 3 =$	No	$3 \times 3 =$	No
3 and 6	$3 + 6 =$	Yes	$3 \times 6 =$	No
4 and 5	$4 + 5 =$		$4 \times 5 =$	

The numbers are \_\_\_\_\_ and \_\_\_\_\_.

Check: \_\_\_\_\_

2. The sum of two numbers is 12. Their product is 35. What are the numbers?

Facts: 1. \_\_\_\_\_

2. \_\_\_\_\_

GUESS		CHECK		CHECK
Numbers	Sum (+)			

Sentence: \_\_\_\_\_

Check: \_\_\_\_\_

3. The sum of two numbers is 18. Their difference is 2. What are the numbers?

Facts: 1. \_\_\_\_\_  
2. \_\_\_\_\_

Chart:

Sentence: \_\_\_\_\_

Check: \_\_\_\_\_

4. There are 7 more boys than girls in a class of 23. How many of each are there?

Facts: 1. \_\_\_\_\_  
2. \_\_\_\_\_

Number of Girls	Number of Boys	Total Students (Boys and Girls)	Does total = 23?
6	$6 + 7 = \square$	$6 + 13 = 19$	No
7			

Sentence: \_\_\_\_\_

Check: \_\_\_\_\_

5. John has a problem. Can you help him solve it?

"I am thinking of a two-digit number. The sum of the digits is 8. The product of the digits is 15. What is my number?"

Facts: 1. \_\_\_\_\_  
2. \_\_\_\_\_

Two-Digit Number	Sum (= 8)	Product (= 15)	Is this my number?
71	$7 + 1 = 8$	$7 \times 1 = 7$	No
62	$6 + 2 = 8$	$6 \times 2 = 12$	

Sentence: \_\_\_\_\_

Check: \_\_\_\_\_

6. The sum of Nick's and Maria's ages is 25. Nick is one year older than Maria. How old is Maria?

Facts: 1. \_\_\_\_\_  
2. \_\_\_\_\_

Maria's Age	Nick's Age	Sum of Ages	Is sum of ages = 25?
7	$7 + 1 = 8$	$8 + 7 = 15$	

Sentence: \_\_\_\_\_

Check: \_\_\_\_\_



7. José has \$90 in \$5 and \$10 bills. He has 12 bills. How many of each does he have?



Sentence: \_\_\_\_\_

Check: \_\_\_\_\_

### Skill Builder



1. Use a calculator.

a)  $660 \div 3 =$  \_\_\_\_\_

b)  $384 \div 6 =$  \_\_\_\_\_

c)  $2412 \div 3 =$  \_\_\_\_\_

d)  $468 \div 6 =$  \_\_\_\_\_

e)  $872 \div 4 =$  \_\_\_\_\_

f)  $496 \div 8 =$  \_\_\_\_\_

g)  $348 \div 4 =$  \_\_\_\_\_

h)  $424 \div 8 =$  \_\_\_\_\_

i)  $216 \div 9 =$  \_\_\_\_\_

2. Divide.

a)  $3 \overline{)66}$

b)  $3 \overline{)120}$

c)  $4 \overline{)88}$

d)  $8 \overline{)160}$



NO CALCULATOR

e)  $6 \overline{)66}$

f)  $6 \overline{)180}$

g)  $8 \overline{)88}$

h)  $8 \overline{)240}$

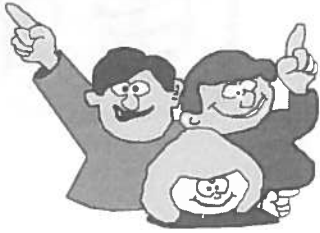
i)  $9 \overline{)99}$

j)  $9 \overline{)180}$

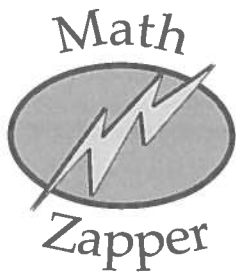
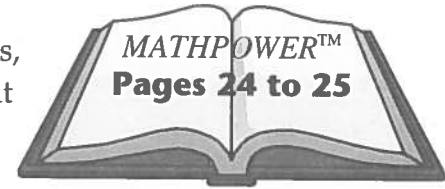
k)  $3 \overline{)360}$

l)  $8 \overline{)480}$

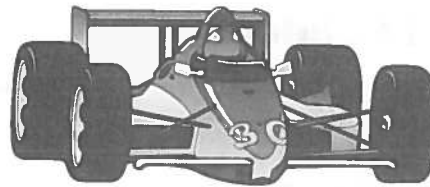
## LEARNING TOGETHER Divisibility Tests



Work together with your classmates, using your *MATHPOWER™* student text, pages 24 and 25.



How many numbers less than 500 end in 5?



### Skill Builder

1. Write the missing numbers in each pattern.

a) 6, 8, 10, \_\_\_\_\_, 14, 16, 18, \_\_\_\_\_, 22

b) 27, 24, 21, \_\_\_\_\_, 15, 12, \_\_\_\_\_, 6

c) 30, 25, 20, \_\_\_\_\_, 10, \_\_\_\_\_, 0

2. Multiply.

a)  $3 \times 7 =$  \_\_\_\_\_

b)  $8 \times 4 =$  \_\_\_\_\_

c)  $3 \times 10 =$  \_\_\_\_\_

d)  $11 \times 3 =$  \_\_\_\_\_

e)  $4 \times 4 =$  \_\_\_\_\_

f)  $2 \times 6 =$  \_\_\_\_\_

g)  $5 \times 5 =$  \_\_\_\_\_

h)  $11 \times 2 =$  \_\_\_\_\_

i)  $2 \times 8 =$  \_\_\_\_\_

j)  $3 \times 9 =$  \_\_\_\_\_



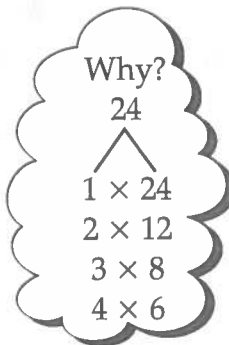
NO CALCULATOR

# 1.8 Factors and Divisibility

**Divisible**  
 A number divided by a second number gives a remainder of zero.  
 $84 \div 7 = 12$ , Remainder 0

A number is divisible by	Divisibility Rules	Examples
2	if the last digit is 0, 2, 4, 6, 8	28, 42, 116
3	if the sum of its digits is divisible by 3	27 <b>Why?</b> $2 + 7 = 9$ $9 \div 3 = 3$
4	if the number formed by its last 2 digits is divisible by 4	148 <b>Why?</b> $48 \div 4 = 12$
5	if the last digit is 0 or 5	65, 90
10	if the last digit is 0	20, 1140

Factors of 24 are 1, 2, 3, 4, 6, 8, 12, 24.



## Practice

1. State the missing factor.

a)  $10 \times \underline{\quad} = 80$       b)  $\underline{\quad} \times 8 = 16$       c)  $\underline{\quad} \times 4 = 12$

d)  $10 \times \underline{\quad} = 20$       e)  $6 \times \underline{\quad} = 18$       f)  $\underline{\quad} \times 7 = 21$

2. Write factors for each of the following.

a)  $\underline{\quad} \times \underline{\quad} = 12$       b)  $\underline{\quad} \times \underline{\quad} = 16$       c)  $\underline{\quad} \times \underline{\quad} = 30$

d)  $\underline{\quad} \times \underline{\quad} = 18$       e)  $\underline{\quad} \times \underline{\quad} = 20$       f)  $\underline{\quad} \times \underline{\quad} = 14$

3.  $\left. \begin{array}{l} 12 \\ \wedge \\ 1 \times 12 \\ 2 \times 6 \\ 3 \times 4 \end{array} \right\}$  List the factors of 12 in order from smallest to largest.

Factors of 12 are 1,     ,     ,     ,     , 12.

4.  $\left. \begin{array}{l} 30 \\ \wedge \\ 1 \times 30 \\ 2 \times 15 \\ 3 \times 10 \end{array} \right\}$  Factors of 30 are 1,     ,     ,     ,     ,     ,     .

5. Circle the numbers that have 3 as a factor.

Think:  $27 \div 3 = 9$

16    27    18    53    30    41    48    57



6. Circle the numbers that have 8 as a factor.

12  $\div$  8 = ?

12    24    30    48    68    72    84    96

7. List all of the factors of each number.

36

$\wedge$

$1 \times 36$   
 $2 \times 18$   
 $3 \times 12$   
 $4 \times 9$   
 $6 \times 6$

**Factors of 36 are**  
**1, 2, 3, 4, 6, 9, 12, 18, 36.**



a)  $\left. \begin{array}{l} 12 \\ \wedge \\ 1 \times 12 \end{array} \right\}$

b) 16

c) 18

Factors of 12 are

\_\_\_\_\_

\_\_\_\_\_

d) 24

e) 30

f) 8

\_\_\_\_\_

\_\_\_\_\_



8. Write each number as a **product** of 2 factors in all the ways you can.

a) 
$$\begin{array}{c} 20 \\ \wedge \\ 1 \times 20 \\ 2 \times 10 \\ 4 \times 5 \end{array}$$

b) 
$$\begin{array}{c} 9 \\ \wedge \end{array}$$

c) 
$$\begin{array}{c} 15 \\ \wedge \end{array}$$

d) 
$$\begin{array}{c} 11 \\ \wedge \end{array}$$

e) 10

f) 21

g) 13

h) 45

### Problems and Applications

9. Space Patrol ride tickets are numbered 1 to 50. Tickets whose numbers are **factors** of 50 give a free ride. Which tickets give a free ride?

$$\begin{array}{c} 50 \\ \wedge \end{array}$$

Sentence: \_\_\_\_\_

Check: \_\_\_\_\_

10. Jim's age is an odd number between seven and fifteen. The number has only 3 factors. How old is Jim?

Sentence: \_\_\_\_\_

Check: \_\_\_\_\_

11. There are six factors of 18.

a) What are they?

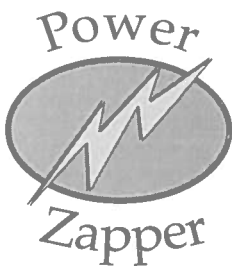
Sentence: \_\_\_\_\_

Check: \_\_\_\_\_

b) Find one other number less than 20 with exactly six factors.

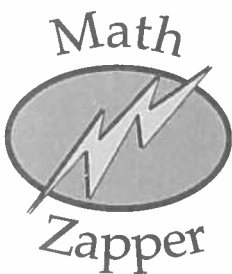
Sentence: \_\_\_\_\_

Check: \_\_\_\_\_

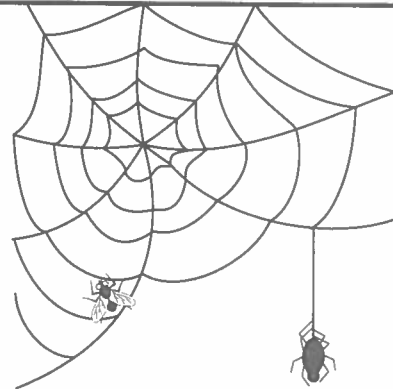


Find the missing numbers.

×	5		7
4			
6		18	
	10		
8			

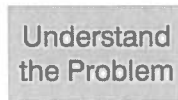


Which has more legs, 5 spiders or 6 flies?



## Skill Builder

1. Arrange the 4 problem solving steps in order.



Problem Solving Steps	Describe each step.
a)	
b)	
c)	
d)	

2. Make an assumption and continue the pattern.

a) 1, 3, 5, 7, \_\_\_\_\_, \_\_\_\_\_

b) 2, 5, 8, 11, \_\_\_\_\_, \_\_\_\_\_

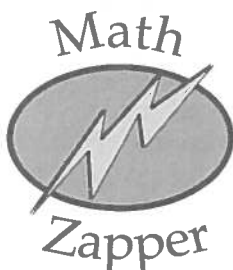
c) 20, 18, 16, 14, \_\_\_\_\_, \_\_\_\_\_

d) 1, 4, 9, 16, \_\_\_\_\_, \_\_\_\_\_

e) 1, 0.1, 0.01, 0.001, \_\_\_\_\_, \_\_\_\_\_

f) 2, 0.2, 0.02, 0.002, \_\_\_\_\_, \_\_\_\_\_

g) 17, 14, 13, 10, \_\_\_\_\_, \_\_\_\_\_

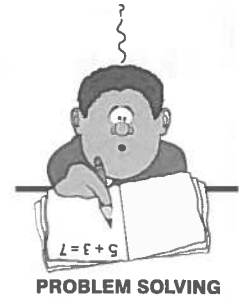


Show 3 ways to use **each** digit from 1 to 4 to make the following statement true.

$$0. \square \square > 0. \square \square$$

# 1.9 Problem Solving: Make an Assumption

## Problems and Applications



1. Find the pattern. What is your assumption? List the next 3 terms.

a) 1, 5, 9, 13, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern: \_\_\_\_\_

Assumption: \_\_\_\_\_

b) 19, 17, 15, 13, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern: \_\_\_\_\_

Assumption: \_\_\_\_\_

c) 21, 20, 18, 15, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern: \_\_\_\_\_

Assumption: \_\_\_\_\_



2. Bob earns \$20 in one week from babysitting.

a) How much will he earn in a year?

Sentence: \_\_\_\_\_

b) What assumptions have you made?

\_\_\_\_\_  
\_\_\_\_\_



3. The zoo is 160 km from the school. The bus can travel at 80 km per hour.

a) How long will the journey take?

Sentence: \_\_\_\_\_

b) What assumptions have you made?

\_\_\_\_\_

\_\_\_\_\_

4. Susan scores 12 points in her first basketball game.

a) How many points will she score in 6 games?

Sentence: \_\_\_\_\_

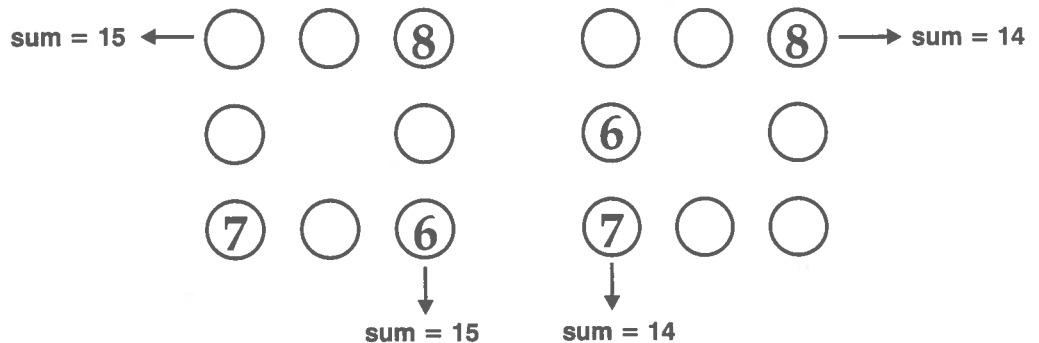
b) What assumptions have you made?

\_\_\_\_\_

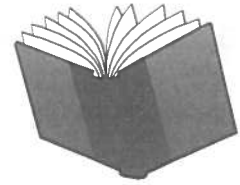
\_\_\_\_\_



Place the numbers from 1 to 5 in the circles.  
The sum of **each** side must be the same.



# Review



1. Do you need an exact answer or an approximate answer?

- a) How long will it take you to shovel snow off of a sidewalk? \_\_\_\_\_
- b) At what time does the football game start? \_\_\_\_\_
- c) How much will you make per hour at a part-time job? \_\_\_\_\_
- d) How much spending money should you take to camp for a month? \_\_\_\_\_

2. Write each number in words.

- a) 3450 \_\_\_\_\_
- b) 703 \_\_\_\_\_
- c) 68.34 \_\_\_\_\_
- d) 76 080 000 \_\_\_\_\_

3. Write each number in expanded form.

$$548\,570 = (5 \times 100\,000) + (4 \times 10\,000) + (8 \times 1000) + (5 \times 100) + (7 \times 10)$$

$$80.91 = (8 \times 10) + (9 \times 0.1) + (1 \times 0.01)$$

- a) 23 000 = \_\_\_\_\_
- b) 56.81 = \_\_\_\_\_
- c) 23 100 000 = \_\_\_\_\_

4. Write each number in standard form.

$$(6 \times 100) + (3 \times 1) + (2 \times 0.1) + (3 \times 0.01) = 603.23$$

- a)  $(2 \times 10) + (7 \times 1) + (3 \times 0.1) + (8 \times 0.01) =$  \_\_\_\_\_
- b)  $6 \times 1000 + 3 \times 100 + 4 \times 10 + 9 \times 1 =$  \_\_\_\_\_
- c)  $(5 \times 10\,000) + (4 \times 1000) + (2 \times 0.1) =$  \_\_\_\_\_

5. Complete the table.

	Number	Round to the Nearest Ten	Round to the Nearest Hundred
a)	662	670	700
b)	55		
c)	842		
d)	234.2		
e)	6573		

6. Complete the table.

	Number	Round to the Nearest Thousand	Round to the Nearest Ten Thousand
a)	38 628	39 000	40 000
b)	8500		
c)	6712		
d)	23 666		
e)	111 444		

7. Round 7.064 to the nearest tenth. \_\_\_\_\_

8. Round 15.609 to the nearest one. \_\_\_\_\_

9. Round 23.7482 to the nearest thousandth. \_\_\_\_\_

10. Round 3.9107 to the nearest hundredth. \_\_\_\_\_



11. Complete the table.

	Exponential Form	Repeated Multiplication	Standard Form
a)	$5^4$	$5 \times 5 \times 5 \times 5$	
b)		$2 \times 2 \times 2 \times 2 \times 2$	32
c)		$9 \times 9 \times 9$	
d)		$10 \times 10 \times 10 \times 10$	
e)	$3^4$		
f)	$10^6$		
g)	$2^3$		
h)	$20^2$		



Example:  $3^4$

Press  3  4  →

12. Write in order from smallest to largest.

a)  $2^5$ ,  $5^2$ ,  $3^4$   
 $\downarrow$   $\downarrow$   $\downarrow$

$5^2$ , \_\_\_\_\_, \_\_\_\_\_

b)  $10^3$ ,  $3^5$ ,  $5^3$   
 $\downarrow$   $\downarrow$   $\downarrow$

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

c)  $4^3$ ,  $3^4$ ,  $2^7$   
 $\downarrow$   $\downarrow$   $\downarrow$

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

d)  $1^5$ ,  $5^1$ ,  $10^1$   
 $\downarrow$   $\downarrow$   $\downarrow$

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

e)  $4^2$ ,  $2^3$ ,  $3^2$   
 $\downarrow$   $\downarrow$   $\downarrow$

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

13. Write each number in scientific notation.

Standard Form      Scientific Notation  
5390      =       $5.39 \times 10^3$



- a)  $57\,820 =$  \_\_\_\_\_  
b)  $129 =$  \_\_\_\_\_  
c)  $11\,000\,000 =$  \_\_\_\_\_

14. Write each number in standard form.

- a)  $8.6 \times 10^2 =$  \_\_\_\_\_  
b)  $4.05 \times 10^5 =$  \_\_\_\_\_  
c)  $1.01 \times 10^4 =$  \_\_\_\_\_



15. The area of the Yukon Territory is  $483\,450 \text{ km}^2$ .

- a) Round  $483\,450$  to the nearest **thousand**. \_\_\_\_\_  
b) Write  $483\,450$  in **scientific notation**. \_\_\_\_\_

16. In 1871, the population of British Columbia was about  $3.6 \times 10^4$ .

Write the population figure in **standard form**. \_\_\_\_\_

17. Circle the numbers that are *divisible by 2*.

**42, 144, 398, 81, 156**

Remember:  
The number must  
end in 0, 2, 4, 6, 8.

18. Circle the numbers that are *divisible by 3*.

**42, 144, 398, 81, 156**

Remember:  
The sum of the digits  
is divisible by 3.

19. Circle the numbers that are *divisible by 5*.

**16, 25, 350, 83, 195**

Remember:  
The number must  
end in 0 or 5.

20. Circle the numbers that are *divisible by 10*.

**35, 64, 90, 85, 100**

Remember:  
The number must  
end in 0.

21. Use factors to complete the following.

a) \_\_\_\_\_ × \_\_\_\_\_ = 20

\_\_\_\_\_ × \_\_\_\_\_ = 20

\_\_\_\_\_ × \_\_\_\_\_ = 20

b) \_\_\_\_\_ × \_\_\_\_\_ = 16

\_\_\_\_\_ × \_\_\_\_\_ = 16

\_\_\_\_\_ × \_\_\_\_\_ = 16

c) \_\_\_\_\_ × \_\_\_\_\_ = 9

\_\_\_\_\_ × \_\_\_\_\_ = 9

d) \_\_\_\_\_ × \_\_\_\_\_ = 24

\_\_\_\_\_ × \_\_\_\_\_ = 24

\_\_\_\_\_ × \_\_\_\_\_ = 24

\_\_\_\_\_ × \_\_\_\_\_ = 24

22. List all the factors of each number.

a) 12  
^

b) 30  
^

c) 18  
^

28  
^  
1 × 28  
2 × 14  
4 × 7  
The factors are  
1, 2, 4, 7, 14, 28.

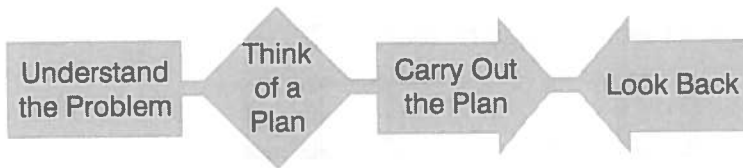
23.

My favourite number is 3 million!

a) Write my number in standard form.

b) Write my number in expanded form.

c) Write my number in scientific notation.



24. A barn contains cows and chickens. There are 9 heads and 20 legs.  
How many cows are in the barn?

Guess & Check

Number of Cows	Number of Chickens	Total Heads	Total Legs	Does heads = 9 and legs = 20?

Sentence: \_\_\_\_\_

Check: \_\_\_\_\_

25. The sum of two numbers is 10. Their product is 21. What are the numbers?

Guess & Check

Numbers	Sum (+)	Product (×)	Is sum = 10 and product = 21?
1 and 10	$1 + 10 = \square$	$1 \times 10 = \square$	

Sentence: \_\_\_\_\_

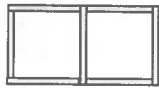
Check: \_\_\_\_\_

26. How many toothpicks are in the sixth diagram?

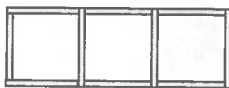
Find a pattern.



1st  
\_\_ toothpicks



2nd  
\_\_ toothpicks



3rd  
\_\_ toothpicks

Sentence: \_\_\_\_\_

Check: \_\_\_\_\_

27. In a week, the caretakers of a junior high school pick up 50 kg of garbage from the school yard.

a) How much garbage is picked up for the whole year?

Sentence: \_\_\_\_\_

Check: \_\_\_\_\_

b) What assumption did you make?

\_\_\_\_\_

### Skill Builder

Complete the cheque below with the following information:

- a) today's date
- b) cheque payable to Carol Jones
- c) total amount is \$127.80
- d) sign cheque with your name

2001-91
_____ 20 _____
\$ _____
_____ DOLLARS
PAY TO THE ORDER OF _____



# Chapter Check



1. Do you need an *exact* answer or an *approximate* answer?

- a) How long will it take you to cut the lawn? \_\_\_\_\_  
b) How much bus fare do you need to get to the library? \_\_\_\_\_

2. Write each number in words.

- a) 3460 \_\_\_\_\_  
b) 607 321 \_\_\_\_\_  
\_\_\_\_\_  
c) 78 903 \_\_\_\_\_  
\_\_\_\_\_

3. Arrange the numbers in order from smallest to largest.

345.6, 366.1, 345.2, 346, 354.2

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_

4. Write in *standard form*.

- a)  $(7 \times 10) + (5 \times 1) + (8 \times 0.1) + (4 \times 0.001) =$  \_\_\_\_\_  
b)  $(5 \times 100) + (8 \times 10) + (1 \times 1) + (2 \times 0.01) =$  \_\_\_\_\_  
c)  $(3 \times 10\,000) + (2 \times 1000) + (4 \times 0.01) =$  \_\_\_\_\_



5. Write each number in *expanded form*.

- a) 5310 = \_\_\_\_\_  
b) 6.89 = \_\_\_\_\_



6. Write as a power of 10.

a)  $1000 = 10^{\square}$

Example:  
 $100 = 10^2$

b)  $10\,000 =$  \_\_\_\_\_

c)  $1\,000\,000 =$  \_\_\_\_\_

d)  $100\,000\,000 =$  \_\_\_\_\_

7. Write in standard form.

**Example:**  
 $3^2 = 9$   
 $4 \times 4 \times 4 = 64$



a)  $2^5 =$  \_\_\_\_\_

b)  $12^2 =$  \_\_\_\_\_

c)  $6 \times 6 \times 6 =$  \_\_\_\_\_

d)  $2 \times 2 \times 2 \times 2 =$  \_\_\_\_\_

8. Write each number in scientific notation.

a)  $3\,850\,000 = 3.85 \times 10^{\square}$

b)  $11\,700 =$  \_\_\_\_\_

c)  $125 =$  \_\_\_\_\_

d)  $5280 =$  \_\_\_\_\_

9. Write each number in standard form.

**Example:**  
 $4.92 \times 10^4 = 49\,200$

a)  $1.65 \times 10^3 =$  \_\_\_\_\_

b)  $3.09 \times 10^5 =$  \_\_\_\_\_

c)  $9.502 \times 10^2 =$  \_\_\_\_\_

d)  $1.5 \times 10^2 =$  \_\_\_\_\_

10. Answer Yes or No.

**Think:**  $93 \div 3$

**HINT:**  
Remainder must be 0.

a) 93 is divisible by 3. \_\_\_\_\_

b) 42 is divisible by 2. \_\_\_\_\_

c) 42 is divisible by 3. \_\_\_\_\_

d) 114 is divisible by 3. \_\_\_\_\_

e) 71 is divisible by 3. \_\_\_\_\_

f) 90 is divisible by 5. \_\_\_\_\_

Use Divisibility Rules (see page 35).

11. What are the next 3 numbers? Describe the pattern.

a) 1, 3, 6, 10, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

b) 10, 12, 14, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Pattern: \_\_\_\_\_

Pattern: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

12. List all the *factors* of the following numbers.

a)



1 ×

2 ×

5 ×

b)



c)

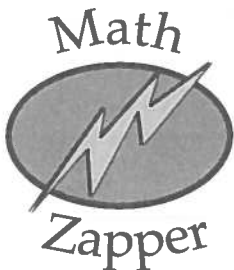
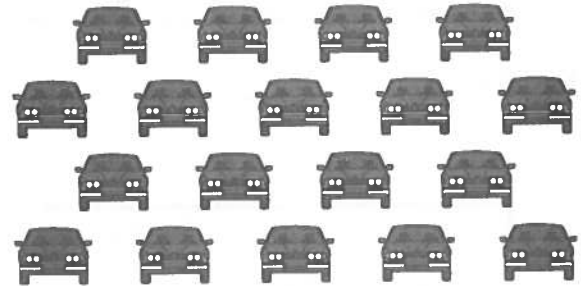


The factors are 1, 2, 5, \_\_\_\_\_  
 \_\_\_\_\_

13. Canada's largest shopping centre is the West Edmonton Mall. It covers an area of 468 000 m<sup>2</sup> and has parking for 20 000 vehicles. Write these numbers in **scientific notation**.

468 000 = 4.68 × 10

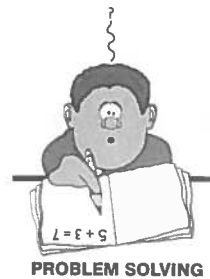
20 000 = \_\_\_\_\_



What day is the 100th day of the year?



# Problem Solving: Using the Strategies



1. Last week, Frank earned \$25.00 from babysitting. He is saving to buy a \$160.00 jacket. How many weeks will he need to babysit in order to buy the jacket? What assumption did you make?

Understand the Problem

Think of a Plan

Carry Out the Plan

Look Back

Sentence: \_\_\_\_\_

Assumption: \_\_\_\_\_

Check: \_\_\_\_\_

2. Describe the pattern and complete the table.

a)

1	4	7	9	12	15		
7	10	13				23	32

Pattern: \_\_\_\_\_

b)

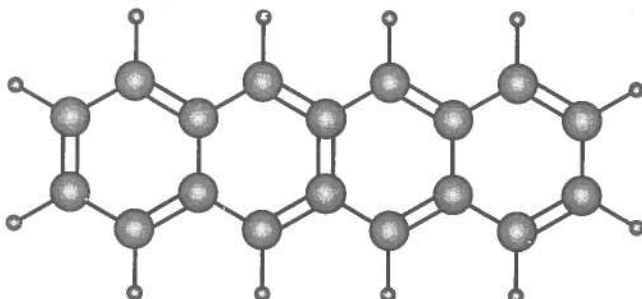
0.2	0.1	0.6	1.2	0.4	2.7		
0.5	0.4	0.9				3.5	1.7

Pattern: \_\_\_\_\_

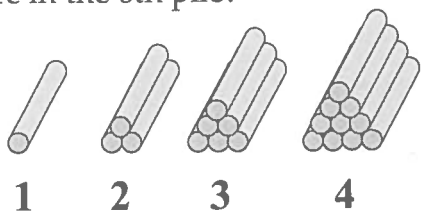
c)

1	2	3	4	6	7		
3	6	9				27	30

Pattern: \_\_\_\_\_



3. At a campsite, the logs are piled in triangles. If the pattern continues, how many logs are in the 6th pile?



Pattern: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Sentence: \_\_\_\_\_

4. Solve. Find the pattern and write the next three rows.

$2 + 4 =$  \_\_\_\_\_

$2 + 4 + 6 =$  \_\_\_\_\_

$2 + 4 + 6 + 8 =$  \_\_\_\_\_

$2 + 4 + 6 + 8 + 10 =$  \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. The sum of two numbers is 11. Their product is 24. What are the numbers?

GUESS	CHECK	CHECK		
Numbers	Sum (+)	Is sum = 11?	Product (×)	Is product = 24?
1 and 10	$1 + 10 =$ <input type="text"/>	Yes	$1 \times 10 =$ <input type="text"/>	No

Sentence: \_\_\_\_\_

6. Zahia has \$1.00 in dimes and quarters. She has 7 coins. How many dimes and how many quarters does she have?

Guess  
and  
Check

Sentence: \_\_\_\_\_

7. Look for a pattern and find the next 3 numbers.

a) 81, 80, 79, 78, 77, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

b) 7, 10, 13, 16, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

c) 1.3, 1.5, 1.7, 1.9, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

d) 3, 6, 12, 24, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

8. Mario runs for 20 min in the morning.

a) How many minutes will he run in a week?

Sentence: \_\_\_\_\_

b) How many hours will he run in the month of September?

1 h = 60 min

September = \_\_\_\_\_ days

Sentence: \_\_\_\_\_

c) What assumption have you made?

\_\_\_\_\_

9. Place the numbers 1 to 7 in the circles so that the sum of each row and column is the same.

