

CHAPTER

7

Patterns

7.1 Variables in Expressions

7.2 Words and Symbols

7.3 Solving Equations

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7.6 Ordered Pairs

7.7 The Coordinate Plane

7.8 Graphing Ordered Pairs

7.9 Graphing Relations

Review

Chapter Check

Problem Solving: Using the Strategies

Answers CHAPTER 7 Patterns

①

②

③

Skill Builder



1. Add.

a) $5 + 8 = \underline{\quad}$ b) $7 + 9 = \underline{\quad}$

c) $12 + 13 = \underline{\quad}$ d) $21 + 6 = \underline{\quad}$

Rough Work:

$$\begin{array}{r} 12 \\ +13 \\ \hline \end{array} \qquad \begin{array}{r} 21 \\ + 6 \\ \hline \end{array}$$

2. Subtract.

a) $21 - 5 = \underline{\quad}$ b) $32 - 12 = \underline{\quad}$

c) $24 - 15 = \underline{\quad}$ d) $41 - 13 = \underline{\quad}$

Rough Work:

3. Multiply.

a) $5 \times 3 = \underline{\quad}$ b) $9 \times 6 = \underline{\quad}$ c) $11 \times 7 = \underline{\quad}$ d) $12 \times 7 = \underline{\quad}$

e) $4 \times 9 = \underline{\quad}$ f) $8 \times 8 = \underline{\quad}$ g) $10 \times 5 = \underline{\quad}$ h) $3 \times 7 = \underline{\quad}$

4. Divide.

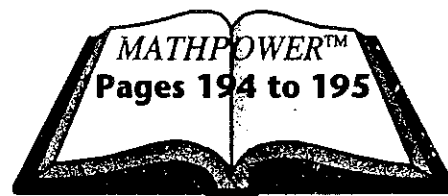
a) $18 \div 3 = \underline{\quad}$ b) $24 \div 6 = \underline{\quad}$ c) $72 \div 6 = \underline{\quad}$ d) $120 \div 10 = \underline{\quad}$

e) $24 \div 4 = \underline{\quad}$ f) $35 \div 7 = \underline{\quad}$ g) $16 \div 4 = \underline{\quad}$ h) $100 \div 10 = \underline{\quad}$

GETTING STARTED



Work together with your classmates, using your **MATHPOWER™** student text, pages 194 and 195.



Mental Math

1. Add.



a) $6 + 7 = \underline{\quad}$

b) $10 + 8 = \underline{\quad}$

c) $9 + 5 = \underline{\quad}$

d) $4 + 9 = \underline{\quad}$

e) $5 + 15 = \underline{\quad}$

f) $12 + 7 = \underline{\quad}$

2. Subtract.

a) $10 - 3 = \underline{\quad}$

b) $12 - 8 = \underline{\quad}$

c) $15 - 7 = \underline{\quad}$

d) $16 - 9 = \underline{\quad}$

e) $10 - 6 = \underline{\quad}$

f) $11 - 2 = \underline{\quad}$

3. Multiply.

a) $6 \times 8 = \underline{\quad}$

b) $9 \times 7 = \underline{\quad}$

c) $4 \times 6 = \underline{\quad}$

d) $7 \times 10 = \underline{\quad}$

e) $5 \times 11 = \underline{\quad}$

f) $3 \times 8 = \underline{\quad}$

4. State the quotient and the remainder.

a) $\begin{array}{r} \square \\ 4 \overline{)13} \end{array} \text{ R } \square$

b) $5 \overline{)47}$

c) $8 \overline{)35}$

d) $7 \overline{)50}$

e) $2 \overline{)23}$

f) $5 \overline{)56}$

5. Calculate.

BEDMAS

a) $5 \times 8 + 3 = \underline{\quad}$

b) $3 \times 6 + 2 = \underline{\quad}$

c) $2 \times 7 + 1 = \underline{\quad}$

d) $3 \times 4 + 2 = \underline{\quad}$

6. Calculate.

a) $8 \times 3 - 4 = \underline{\quad}$

b) $5 \times 6 - 2 = \underline{\quad}$

c) $3 \times 6 - 4 = \underline{\quad}$

d) $3 \times 4 - 8 = \underline{\quad}$

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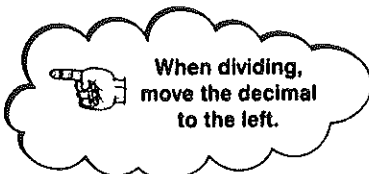
7. Calculate.

a) $36 \div 10 =$ _____

c) $415 \div 100 =$ _____

e) $206 \div 10 =$ _____

g) $3.8 \div 10 =$ _____

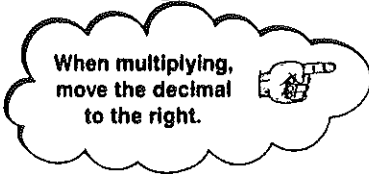


b) $25 \times 100 =$ _____

d) $76 \times 10 =$ _____

f) $1.5 \times 1000 =$ _____

h) $5.2 \times 10 =$ _____



8. Simplify.

a) $4^2 = 4 \times 4 =$ _____

b) $2^3 = 2 \times 2 \times 2 =$ _____

c) $5^2 =$ _____

d) $6^2 =$ _____

e) $4^2 + 2 = 4 \times 4 + 2$
= _____

f) $5^2 - 10 =$ _____
= _____

Skill Builder

1. Find the missing value.

a) $(+10) + (\quad) = +13$

b) $(+5) + (\quad) = +2$

c) $(\quad) + (+10) = +11$

d) $(\quad) + (+3) = -1$

e) $(+10) - (\quad) = +2$

f) $(+12) - (\quad) = 0$

g) $(\quad) - (+7) = +6$

h) $(\quad) - (+2) = +8$

i) $(+7) - (\quad) = +2$



2. Calculate.

a)
$$\begin{array}{r} 56 \\ -9 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 60 \\ \times 7 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 78 \\ -12 \\ \hline \end{array}$$

d) $10 \text{ cubed} =$ _____

e) $\frac{56}{7} =$ _____

f)
$$\begin{array}{r} 43 \\ -9 \\ \hline \end{array}$$

g)
$$\begin{array}{r} 48 \\ +12 \\ \hline \end{array}$$

h)
$$\begin{array}{r} 40 \\ \times 3 \\ \hline \end{array}$$

i)
$$\begin{array}{r} 12 \\ \times 20 \\ \hline \end{array}$$

j)
$$\begin{array}{r} 72 \\ -12 \\ \hline \end{array}$$

7.1 Variables in Expressions



Practice

Find the answer.

1. Evaluate the following.

a) $n + 5, n = 4$

$$n + 5 = 4 + 5$$

$$= \underline{\quad}$$

Substitute 4.

b) $3n, n = 2$

$$3 \times n = 3 \times \underline{\quad}$$

$$= \underline{\quad}$$

Substitute 2.

c) $n - 2, n = 5$

$$n - 2 = \underline{\quad}$$

$$= \underline{\quad}$$

d) $7 + n, n = 0$

e) $4n, n = 0$

f) $11 + n, n = 4$

g) $2n + 1, n = 3$

$$(2 \times n) + 1 = (2 \times \boxed{\quad}) + 1$$

$$= \underline{\quad} + 1$$

$$= \underline{\quad}$$

h) $3n + 2, n = 1$

i) $4n - 6, n = 3$

j) $6 - 2n, n = 1$

2. Substitute 3 for m in each expression and then, simplify.

a) $4m = 4 \times 3$

$$= \underline{\quad}$$

b) $m + 5$

c) $m - 1$

d) $7 - m$

e) $12 - m$

f) $m + m$

g) $6m$

h) $m + 11$

i) $2m + 1$

3. Substitute 4 for x in each expression and then, simplify.

a) $x + 5 =$

b) $5x =$

c) $10 - x =$

d) $2x - 2 = (2 \times \square) - 2$

$= \square - 2$

$=$ _____

e) $2x + 3 =$

f) $10 - 2x = 10 - (2 \times \square)$

$= 10 -$ _____

$=$ _____

g) $12 - 3x =$

4. Substitute $y = 2$ and then, simplify.

a) $5 - y =$

b) $y - 2 =$

c) $2y =$

d) $2y - 3 =$

e) $7 - 2y =$

f) $6 - 3y =$

5. Evaluate the following expressions for $m = 2$ and $n = 3$.

a) $m + n = 2 + 3$

$=$

b) $n - m =$

c) $2m + n =$

Do
multiplication
first.

d) $3m - n =$

e) $3(m + n) =$

Do what's
in the
brackets first.

6. Evaluate the following expressions for $x = 2.4$ and $y = 4.2$.

a) $x + y = 2.4 + 4.2$

b) $y - x =$

c) $3x =$

$=$ _____



d) $3y =$

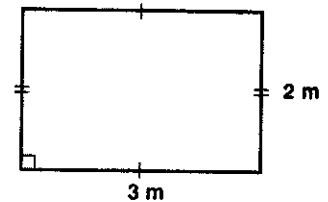


e) $3(x + y) =$

Problems and Applications

7. The formula for the perimeter of a rectangle is $2(l + w)$.
Find the perimeter if $l = 3$ m and $w = 2$ m.

$2(l + w) =$



Sentence: _____

8. Sam bought some pens for \$8 each. Let n stand for the number of pens he bought.
The expression for the total cost is $8n$.

What is the cost of the following?

a) 5 pens

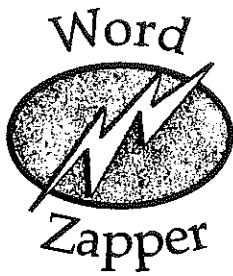
b) 10 pens

$8n =$

$=$

9. Make up your own expression using the variable m . _____

Have a classmate simplify the expression if $m = 5$.



The real word **TIP** written backward is **PIT**. Find 2 other words that give real words when they are written backward.

Skill Builder

1. Find the perimeter and area of a rectangle if $l = 5 \text{ cm}$ and $w = 2 \text{ cm}$.

a) Perimeter = $2(l + w)$

b) Area = lw

2. Match the following.

a) 3 increased by 12 20

b) double 10 40

c) 50 decreased by 10 15

d) triple 10 16

e) half of 16 30

f) double 6, then add 4 4

g) 2 squared 2

h) half of 4 8

3. Solve.

a) $6 \times 3 = \underline{\quad}$ b) $5 \times 8 = \underline{\quad}$ c) $9 \times 3 = \underline{\quad}$ d) $4 \times 4 = \underline{\quad}$

e) $10 \times 10 = \underline{\quad}$ f) $7 \times 7 = \underline{\quad}$ g) $8 \times 6 = \underline{\quad}$ h) $10 \times 2 = \underline{\quad}$

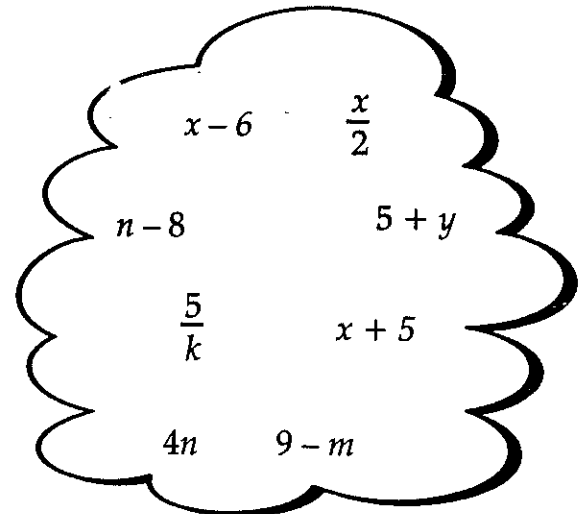
7.2 Words and Symbols

Practice



1. Choose an expression from the cloud to match the words for each of the following.

- a) a number increased by 5 _____
- b) a number decreased by 6 _____
- c) a number multiplied by 4 _____
- d) a number divided by 2 _____
- e) 8 subtracted from a number _____
- f) the sum of 5 and a number _____
- g) a number subtracted from 9 _____
- h) 5 divided by a number _____



2. The variable x represents a number. Write the words that can be represented by each of the following expressions.

- a) $x + 6$ _____
- b) $x - 5$ _____
- c) $4x$ _____
- d) $2x$ _____
- e) $9 + x$ the sum of nine and a number
- f) $7 - x$ _____
- g) $\frac{x}{3}$ _____
- h) $\frac{7}{x}$ _____
- i) $\frac{x}{2} - 3$ _____
- j) $8 + y$ _____

3. Write each of the following using symbols.

a) m divided by 4

b) n increased by 2

c) 10 decreased by n

d) 12 divided by x

e) half of a number

f) five times a number

$5x$

g) six less than a number

h) twenty-five divided by a number

i) seven times a number

Problems and Applications

4. Circle the correct expression for each of the following.

a) Sandra's height increased by five centimetres

(i) $h - 5$

(ii) $h + 5$

(iii) $5h$

b) the width decreased by six metres

(i) $w - 6$

(ii) $w + 6$

(iii) $\frac{w}{6}$

c) the length multiplied by ten

(i) $\frac{l}{10}$

(ii) $l + 10$

(iii) $10l$

d) the time divided by three

(i) $\frac{t}{3}$

(ii) $3t$

(iii) $\frac{3}{t}$

e) six times the number of pens

(i) $\frac{n}{6}$

(ii) $6n$

(iii) $\frac{6}{n}$

f) the number of Canadians who have flown in space increased by 2

(i) $2n$

(ii) $n - 2$

(iii) $n + 2$

g) The mass of a Siberian tiger is ten times the mass of a Canadian beaver.

(i) $t = 10b$

(ii) $t = \frac{b}{10}$

(iii) $t = b + 10$

h) The Toronto Blue Jays won two more games than the Atlanta Braves.

(i) $t = 2 - a$

(ii) $t = 2 + a$


(iii) $t = 2a$

5. P.J. earns \$5.00/h cutting lawns in the neighbourhood.

Time (h)	1	2	3	4	5	6	7	8
Pay (\$)	5	10						

a) Complete the table.

b) Write an expression for the amount earned. _____



Use each number from the squares only once to make the following number sentences true.

235789

○

+

○

=

○

○

-

○

=

○

Skill Builder

1. Evaluate each expression for $a = 5$.

$$\begin{aligned} \text{a) } a + 2 &= \square + 2 \\ &= \underline{\hspace{2cm}} \end{aligned}$$

$$\text{b) } 10 - a =$$

$$\text{c) } 7 - a =$$

$$\text{d) } 5 - a =$$

$$\begin{aligned} \text{e) } 2a + 1 &= (2 \times 5) + 1 \\ &= \square + 1 \\ &= \underline{\hspace{2cm}} \end{aligned}$$

$$\text{f) } 4a + 3 =$$

$$\begin{aligned} \text{g) } 3 + 2a &= 3 + (2 \times 5) \\ &= 3 + \square \\ &= \underline{\hspace{2cm}} \end{aligned}$$

$$\text{h) } 1 + 3a =$$

2. Evaluate each expression for $t = 2.3$.

$$\text{a) } t + 1 =$$

$$\text{b) } 3 - t =$$

$$\text{c) } t + 7 =$$



3. Calculate.

Watch the signs!

$$\begin{array}{r} \text{a) } 15 \\ + 9 \\ \hline \end{array}$$

$$\begin{array}{r} \text{b) } 27 \\ + 9 \\ \hline \end{array}$$

$$\begin{array}{r} \text{c) } 25 \\ + 9 \\ \hline \end{array}$$

$$\begin{array}{r} \text{d) } 25 \\ + 19 \\ \hline \end{array}$$

$$\begin{array}{r} \text{e) } 67 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} \text{f) } 27 \\ - 4 \\ \hline \end{array}$$

$$\begin{array}{r} \text{g) } 92 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} \text{h) } 48 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} \text{i) } 18 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} \text{j) } 25 \\ \times 5 \\ \hline \end{array}$$



NO CALCULATOR

7.3 Solving Equations



Practice

1. Substitute the value into each equation. Does it make the sentence true or false?

	Equation	Value of Variable	Substitute	True or False
a)	$n + 7 = 10$	$n = 3$	$3 + 7 = 10$	True
b)	$x - 5 = 10$	$x = 5$		
c)	$3b = 18$	$b = 15$		
d)	$5u = 20$	$u = 4$		
e)	$\frac{x}{5} = 2$	$x = 15$		
f)	$2w = 6$	$w = 3$		
g)	$2z + 1 = 7$	$z = 3$		
h)	$3e - 2 = 10$	$e = 4$		

2. Solve each equation.

a) $x + 3 = 7$

$x = \underline{\quad}$

b) $f + 3 = 4$

$f = \underline{\quad}$

c) $m + 2 = 9$

d) $n + 1 = 6$

e) $y + 4 = 8$

f) $z + 8 = 12$

3. Solve each equation.

a) $x - 5 = 7$

b) $a - 3 = 7$

c) $z - 1 = 6$

d) $n - 8 = 0$

e) $w - 2 = 4$

f) $4 - n = 0$

4. Solve each equation.

a) $3n = 6$

b) $2s = 10$

c) $6x = 24$

d) $5y = 20$

$n = \underline{\hspace{2cm}}$

5. Solve the following equations.

a) $\frac{x}{4} = 3$

b) $\frac{y}{2} = 4$

c) $\frac{c}{7} = 3$

$x = \underline{\hspace{2cm}}$

d) $\frac{r}{2} = 8$

e) $\frac{m}{4} = 1$

f) $\frac{n}{3} = 6$

6. Solve these equations.

Watch the signs!

a) $5 + x = 12$

b) $y + 7 = 13$

c) $\frac{m}{4} = 2$

d) $\frac{n}{5} = 5$

$x = \underline{\hspace{2cm}}$

e) $8a = 32$

f) $3q = 18$

g) $y - 3 = 8$

h) $b - 9 = 3$

7. Solve these equations.

Use guess and check.

a) $2n + 7 = 15$

Guess	Substitute into $2n + 7 = 15$	Check
$n = 1$	$(2 \times 1) + 7 = 9$	Too small
$n = 2$	$(2 \times 2) + 7 = \square$	

Answer: $n = \underline{\hspace{2cm}}$

b) $3x - 2 = 7$

Use guess and check.

Guess	Substitute into $3x - 2 = 7$	Check
$x = 1$	$(3 \times 1) - 2 = 1$	

Answer: $x =$ _____

c) $4p + 2 = 22$

Answer: _____

Problems and Applications

8. a) If $x = 5$, what numbers can be placed in the triangle and the square to make the equation true?

$$x + \triangle = \square$$

- b) If $x = 3$, what numbers can be placed in the triangle and the square to make the equation true.

$$\triangle + x = \square$$

- c) If $x = 2$, what numbers can be placed in the triangle and the square to make the equation true?

$$\triangle - x = \square$$

9. A copy shop charges 9¢ per page.
a) How much would it cost to copy 225 pages?

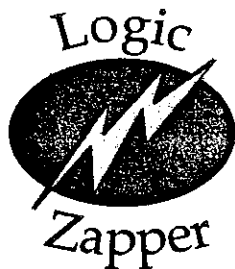
Write an equation.

Sentence: _____

- b) How many pages can you copy for \$18.00?

10. John spent \$28.00 on rides at the exhibition.
If each ride cost \$2.00, on how many rides did he go?

Write an equation.



What relation is a man to his mother's brother?

Skill Builder

1. Evaluate the expression $2n + 1$ for each value of n .

Substitute.

a) $n = 3$

$$2n + 1 = (2 \times 3) + 1$$

$$= \square + 1$$

$$= \underline{\hspace{2cm}}$$

b) $n = 1$

$$2n + 1 =$$

c) $n = 0$

d) $n = 6$

e) $n = 10$

f) $n = 5$

2. Use the guess and check method to solve each equation.

a) $n + 8 = 13$

$$n = \underline{\hspace{2cm}}$$

b) $n + 7 = 14$

c) $n - 4 = 7$

d) $n - 3 = 10$

e) $3n = 12$

f) $4n = 20$

g) $2n - 1 = 7$

h) $3n + 1 = 10$

Guess	Substitute	Check

Answer: $n = \underline{\hspace{2cm}}$

Answer: $\underline{\hspace{2cm}}$

3. What is the next number in each pattern?

a) 2, 4, 6, 8, $\underline{\hspace{1cm}}$

b) 2, 5, 7, 10, $\underline{\hspace{1cm}}$

c) 5, 10, 15, 20, $\underline{\hspace{1cm}}$

d) 4, 8, 12, 16, $\underline{\hspace{1cm}}$

e) 13, 11, 9, 7, $\underline{\hspace{1cm}}$

f) 24, 21, 18, $\underline{\hspace{1cm}}$

7.4 Developing Patterns

Practice



1. Tracey's heart beats about 70 times per minute.

a) Complete the table.

Time (min)	1	2	3	4	5	6
Number of Beats	70					

b) Describe the pattern. _____

c) How long would it take Tracey's heart to beat 420 times?



d) How long would it take Tracey's heart to beat 840 times?

e) How many times will Tracey's heart beat in _____.

(i) 20 min?

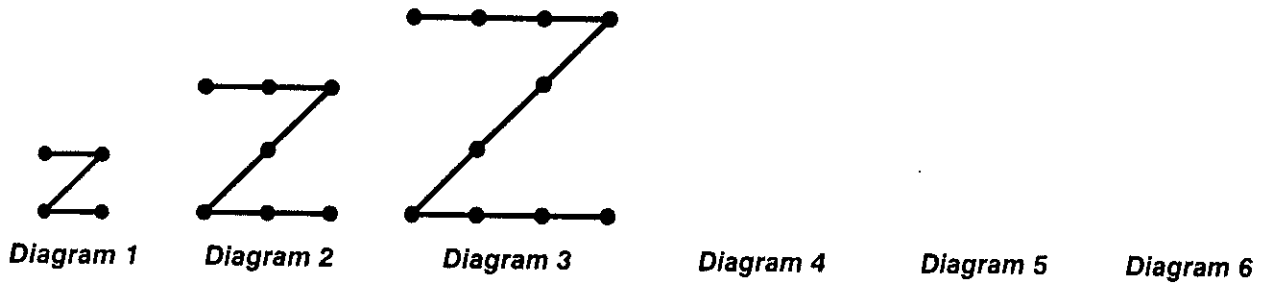
(ii) 1 h?

(iii) 2 h?



2. The letter Z is constructed with dots.

a) Draw the next three diagrams.



b) Copy and complete the table.

Diagram	1	2	3	4	5	6
Number of Dots						

c) By what number does the number of dots increase from one diagram to the next? _____

d) How many dots are in diagram 8? _____

3. The distances that a car travels in different times are shown in the table.

Time (h)	1	2	3	4	5	6
Distance (km)	60	120	180	240	300	360

a) Describe the pattern in words.

b) Write an equation to calculate the distance.

distance → $d = \underline{\quad} \times \underline{\quad}$ $t = \text{time in hours}$

c) How far will the car travel in

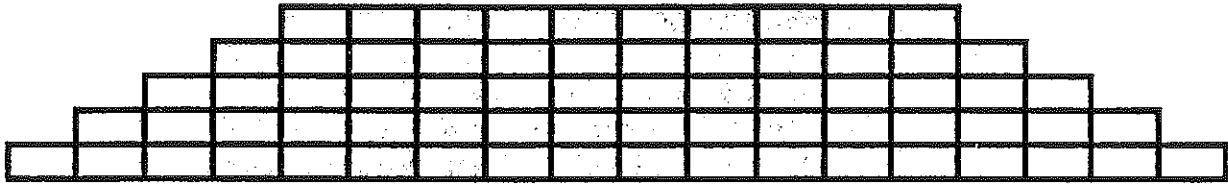


(i) 7 h?

(ii) 9 h?

Problems and Applications

4. A brick patio has 10 rectangular bricks in the first row.



Each row of bricks in the patio has 2 more bricks than the row before it.

- a) Complete the table.

Row	1	2	3	4	5	6	7	8	9	10	11
Number of Bricks											

- b) How many bricks would there be in the

(i) 7th row?

(ii) 9th row?

Skill Builder

1. What are the next 2 numbers in each pattern?

a) 0, 2, 4, 6, _____, _____

b) 0, 3, 6, 9, _____, _____

c) 5, 7, 9, 11, _____, _____

d) 2, 6, 10, 14, _____, _____

2. Calculate.

a) $56 \times 1000 =$ _____

b) $1.2 \times 100 =$ _____

c) $610 \div 10 =$ _____

d) $240 \div 100 =$ _____

e) $\frac{1}{2}$ of 12 = _____

f) $\frac{1}{2}$ of 18 = _____



NO CALCULATOR

7.5 Tables of Values



Practice

1. Complete each table. Describe the pattern in words.

a)

x	$x + 5$
1	
2	
3	
4	
5	
6	

Pattern: Increase the number by _____

b)

x	$3x$
1	
2	
3	
4	
5	
6	

Pattern: _____

c)

x	$x + 8$
1	
2	
3	
4	
5	
6	

Pattern: _____

d)

x	$2x + 1$
1	
2	
3	
4	
5	
6	

Solution:

$(2 \times 1) + 1 = \square$

$(2 \times 2) + 1 = \square$

Pattern: _____

e)

x	$3x - 2$
1	
2	
3	
4	
5	
6	

Solution:


$(3 \times 1) - 2 = \square$

Pattern: _____

Problems and Applications

2. Theatre tickets cost \$45.00 each.

a) Complete the table.



Number of Tickets (n)	Cost (\$)
1	
2	
3	
4	


b) Write an equation that relates the cost (C) to the number of tickets (n).

$$C = \underline{\quad} \times \underline{\quad}$$

3. School shirts cost \$200.00 for the design of the crest plus \$20.00 per shirt.

Complete the table.

Number of Shirts (n)	Cost (\$) ($20n + 200$)
10	$(20 \times 10) + 200 =$
20	$(20 \times 20) + 200 =$
50	
100	



4.



Diagram 1

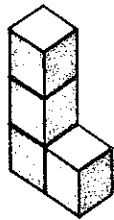


Diagram 2

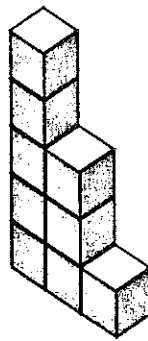


Diagram 3

Diagram 4

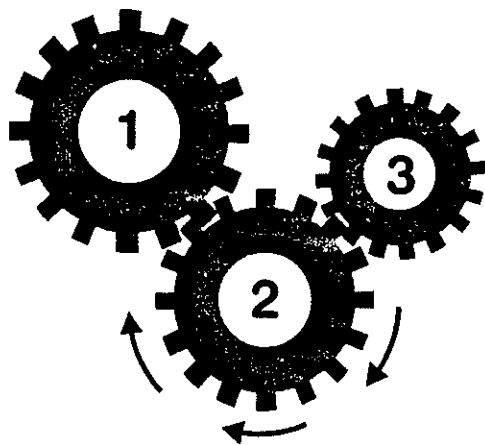
Diagram 5

a) Draw or build with cube-a-links the next 2 diagrams.

b) Complete the table.

Diagram	1	2	3	4	5
Number of Cubes					

c) How many cubes will there be in the 6th diagram? _____



Gear 2 rotates clockwise.
Which way does gear 3 rotate?

Skill Builder

1. Write the solution for each equation.

a) $x + 3 = 10$

$x =$ _____

b) $x + 3 = 7$

c) $b + 2 = 10$

d) $n - 8 = 8$

e) $y + 3 = 6$

f) $x - 5 = 11$

g) $a - 9 = 2$

h) $b + 5 = 6$

i) $n - 4 = 5$

2. Calculate.

a) $7 \times 6 =$ _____

$70 \times 6 =$ _____

$700 \times 6 =$ _____

c) $8 \times 4 =$ _____

$80 \times 4 =$ _____

$800 \times 4 =$ _____

e) $2 \times 8 =$ _____

$20 \times 8 =$ _____

$200 \times 8 =$ _____

b) $5 \times 3 =$ _____

$50 \times 3 =$ _____

$500 \times 3 =$ _____

d) $8 \div 4 =$ _____

$80 \div 4 =$ _____

$800 \div 4 =$ _____

f) $9 \div 9 =$ _____

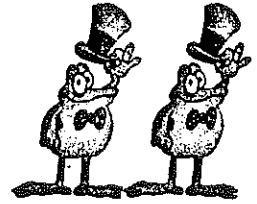
$90 \div 9 =$ _____

$900 \div 9 =$ _____



NO CALCULATOR

7.6 Ordered Pairs



Practice

1. (i) Complete the table. (ii) Write the solutions as ordered pairs.

a) $x + y = 3$

x	y
0	
1	
2	
3	

SUBSTITUTE

$x + y = 3$
 $0 + \underline{\quad} = 3$
 $1 + \underline{\quad} = 3$
 $2 + \underline{\quad} = 3$
 $3 + \underline{\quad} = 3$

b) $x - y = 0$

x	y
	0
	1
	2
	3

SUBSTITUTE

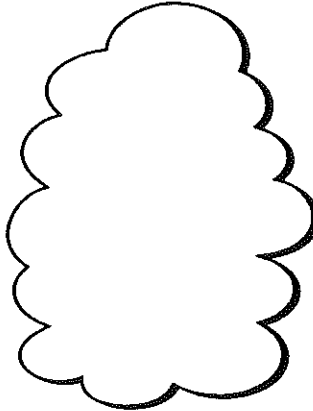
$x - y = 0$
 $\underline{\quad} - 0 = 0$
 $\underline{\quad} - 1 = 0$

Ordered Pairs:

Ordered Pairs:

c) $x + y = 8$

x	y
0	
1	
2	
3	



d) $y - x = 2$

x	y
	2
	3
	4
	5

$y - x = 2$
 $2 - \underline{\quad} = 2$
 $3 - \underline{\quad} = 2$
 $4 - \underline{\quad} = 2$

Ordered Pairs:

Ordered Pairs:

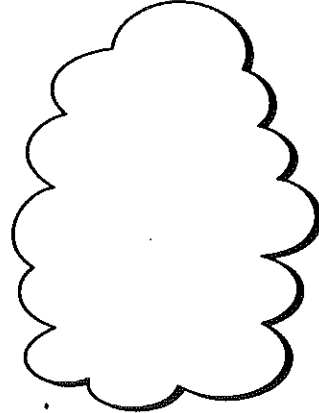
e) $y = x + 5$

x	y
0	
	6
2	
	8

$y = x + 5$
 $\underline{\quad} = 0 + 5$
 $6 = \underline{\quad} + 5$

f) $x - 4 = y$

x	y
4	
	1
6	
	3



2. Find 4 ordered pairs that are solutions for each equation.

Draw a table, first.

a) $x + y = 8$

x	y
0	
1	
2	
3	

(0,)
(,)
(,)
(,)

b) $x + y = 12$

c) $x + y = 7$

d) $x + 3 = y$

e) $x - y = 5$

f) $x - y = 10$

x	y
	0
	1
	2
	3

x	y
11	
12	
13	
14	

3. Write an equation for each table of values.

a)

x	y
0	6
1	5
2	4
3	3
4	2
5	
6	

$x + y =$ _____

b)

x	y
1	0
2	1
3	2
4	3
5	4
6	
7	

c)

x	y
3	4
5	6
7	8
9	10
11	
13	

$y - x =$ _____

Problems and Applications



4. Rene bought 3 sour candies for 15¢.

a) Set up a table of values to show how much each would cost.

(i) 1 candy

(ii) 2 candies

(iii) 4 candies

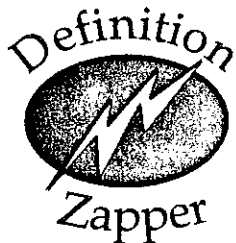
Number of Candies (n)	Cost, in Cents (c)
1	
2	
3	15
4	

Write the ordered pairs.

b) Write an equation that will help Rene determine her cost, in cents, if she knows the number of candies she buys.

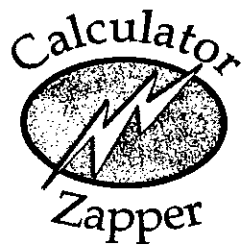
$$c = \underline{\quad} \times \underline{\quad}$$

c) Use your equation to find the cost of 20 candies.

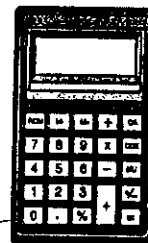


We call (8, 6) an _____.

The 2 numbers in an ordered pair are the _____ of a point.



Use your calculator to find the answers.



Hint:
Press **C** 25 **√**

$1 \times 2 \times 3 \times 4 + 1 = \underline{25}$ or 5^2
 $2 \times 3 \times 4 \times 5 + 1 = \underline{\hspace{2cm}}$ or cloud
 $3 \times 4 \times 5 \times 6 + 1 = \underline{\hspace{2cm}}$ or cloud
 $4 \times 5 \times 6 \times 7 + 1 = \underline{\hspace{2cm}}$ or cloud
 $5 \times 6 \times 7 \times 8 + 1 = \underline{\hspace{2cm}}$ or cloud

Is there a pattern? Describe the pattern. _____

Skill Builder

1. Solve each equation.

a) $x + 2 = 8$

$x = \underline{\hspace{2cm}}$

b) $y + 3 = 5$

$\underline{\hspace{2cm}}$

c) $a - 6 = 3$

$\underline{\hspace{2cm}}$

d) $n - 3 = 12$

$\underline{\hspace{2cm}}$

e) $4g = 36$

$\underline{\hspace{2cm}}$

f) $r + 15 = 25$

$\underline{\hspace{2cm}}$

2. Evaluate the following expressions for $y = 4$.

a) $4y = \underline{\hspace{2cm}}$

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

Substitute

b) $y - 2 = \underline{\hspace{2cm}}$



c) $8y = \underline{\hspace{2cm}}$



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



e) $2y - 1 = \underline{\hspace{2cm}}$



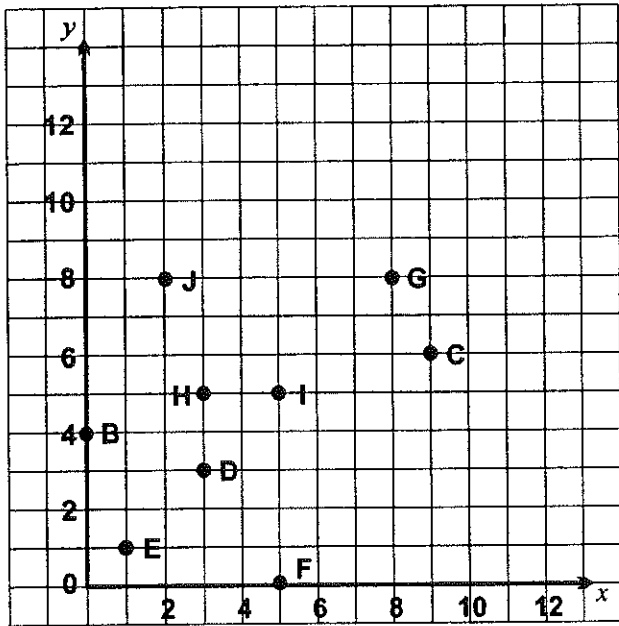
f) $y \div 2 = \underline{\hspace{2cm}}$



7.7 The Coordinate Plane

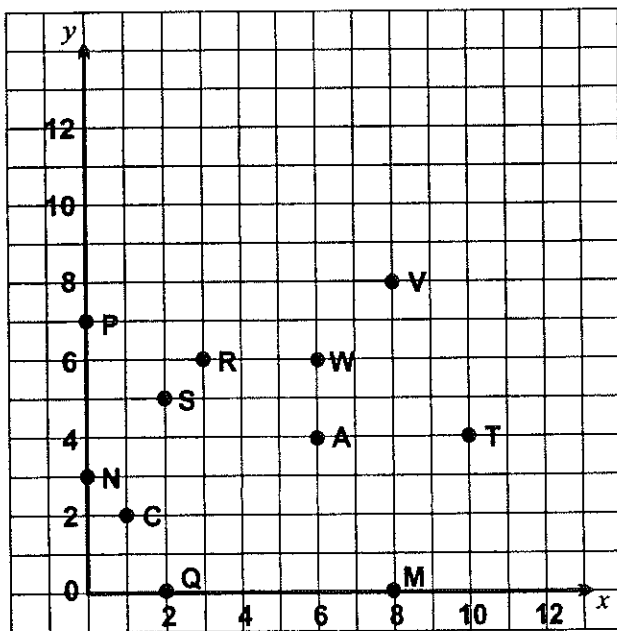
Practice

1. Write the letter of the point named by each ordered pair.



- a) (3, 3) _____
- b) (0, 4) _____
- c) (5, 5) _____
- d) (2, 8) _____
- e) (1, 1) _____
- f) (5, 0) _____
- g) (8, 8) _____
- h) (9, 6) _____
- i) (3, 5) _____

2. Write the coordinates (ordered pair) of each letter on the graph.



- a) P (0, _____)
- b) W _____
- c) N _____
- d) A _____
- e) C _____
- f) V _____
- g) S _____
- h) M _____
- i) Q _____
- j) T _____
- k) R _____

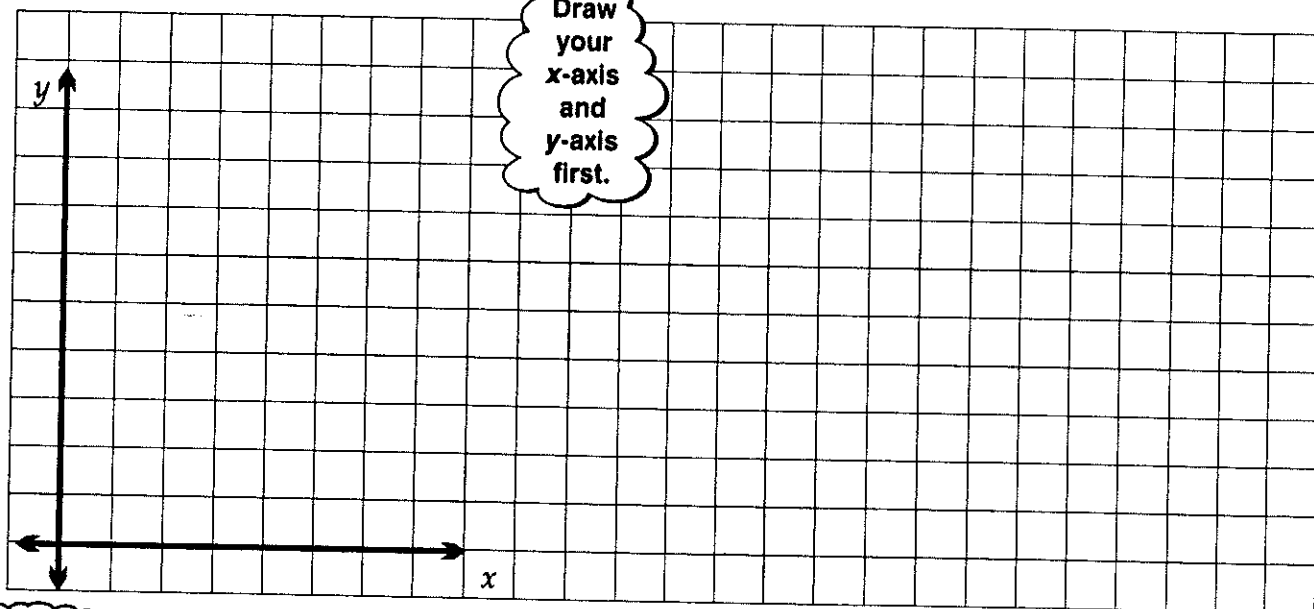
Coordinates — an ordered pair (x, y) that locates a point on the graph

Problems and Applications

3. (i) Graph each set of ordered pairs on a grid.
(ii) Join the points. Use a ruler.
(iii) What is the name of each polygon?

a) $(0, 0), (0, 5), (5, 5), (5, 0)$

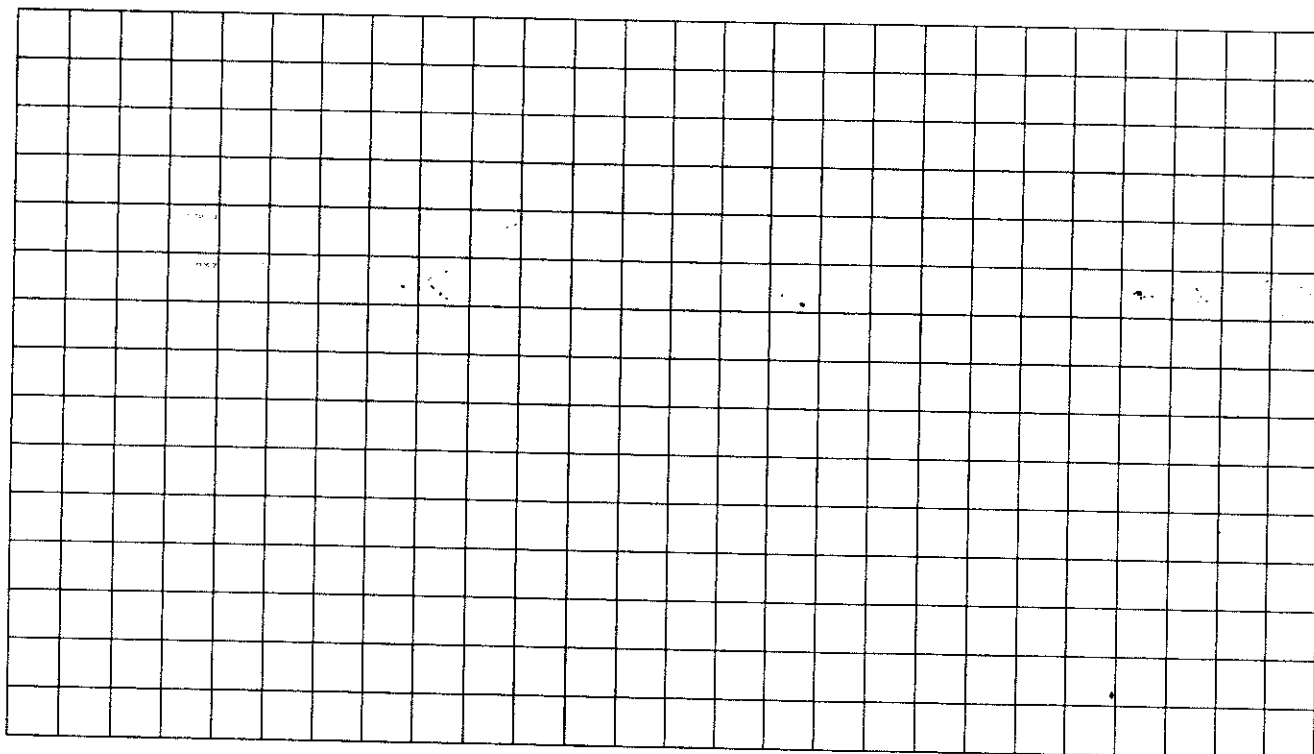
b) $(1, 2), (4, 3), (3, 7)$



Name _____

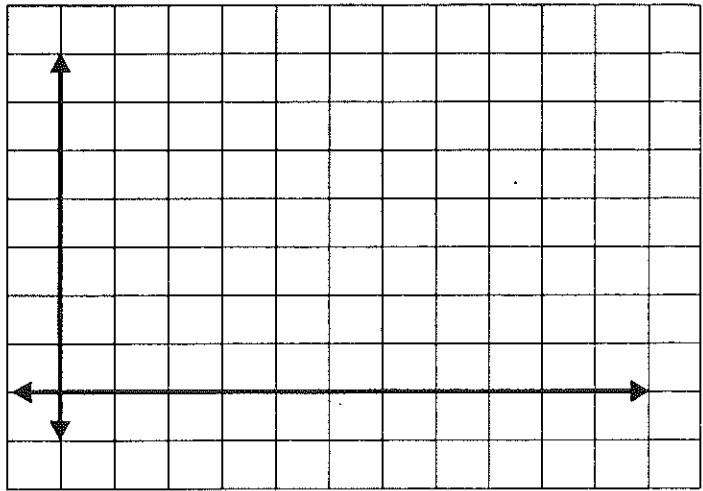
c) $A(1, 7), B(1, 2), C(6, 2), D(6, 7)$

d) $A(0, 2), B(0, 8), C(8, 8), D(8, 2)$



Name _____

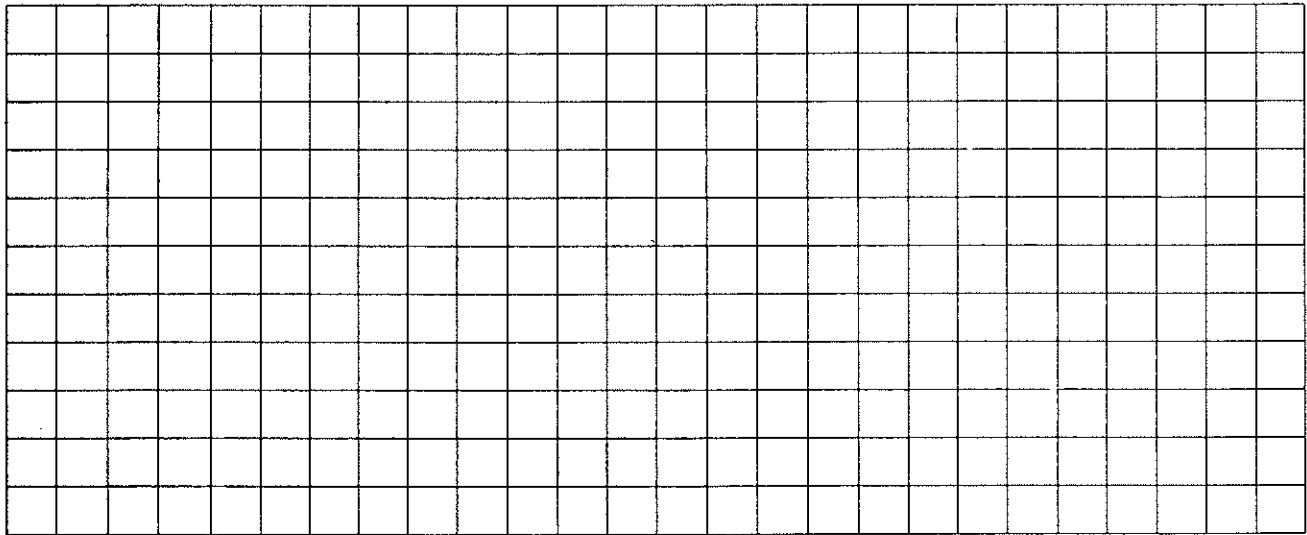
4. (i) Plot the points
 $A(1, 1)$, $B(2, 5)$, $C(7, 5)$, and $D(8, 1)$.
 (ii) Join the points in order.
 (iii) Name the polygon formed.



5. Plot each set of points.

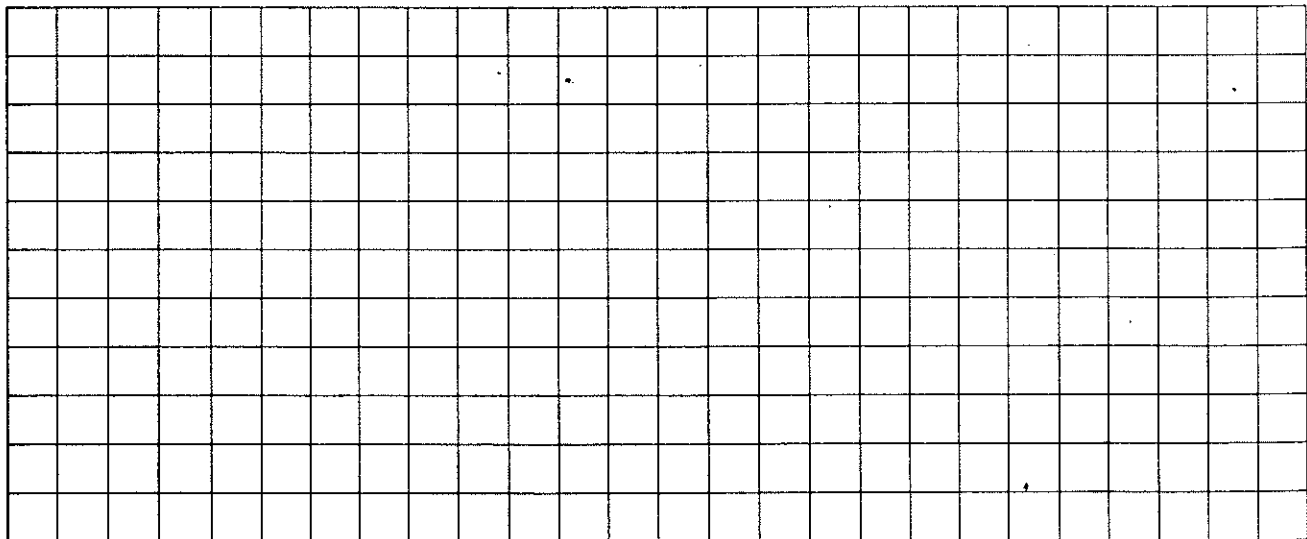
a) $(1, 2)$, $(2, 4)$, $(3, 6)$, $(4, 8)$

b) $(8, 0)$, $(6, 2)$, $(4, 4)$, $(2, 6)$



c) $(2, 0)$, $(2, 1)$, $(2, 3)$, $(2, 4)$

d) $(0, 5)$, $(1, 5)$, $(2, 5)$, $(3, 5)$

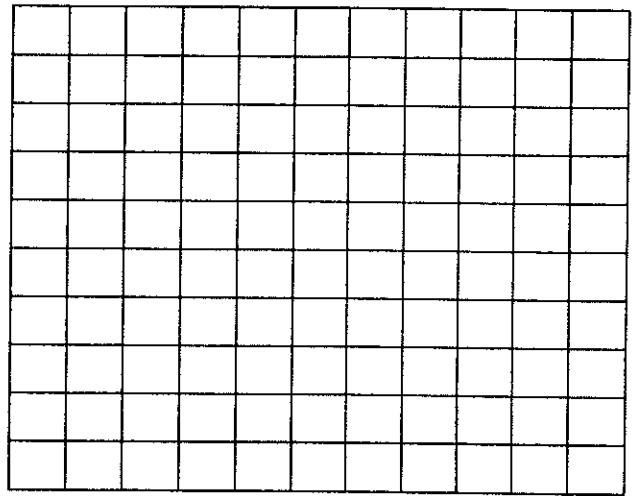


What pattern is formed by each set above? _____

6. (i) Make a table of values for each equation.
 (ii) Write the ordered pairs.
 (iii) Graph each set of points.
 (iv) Identify each pattern.

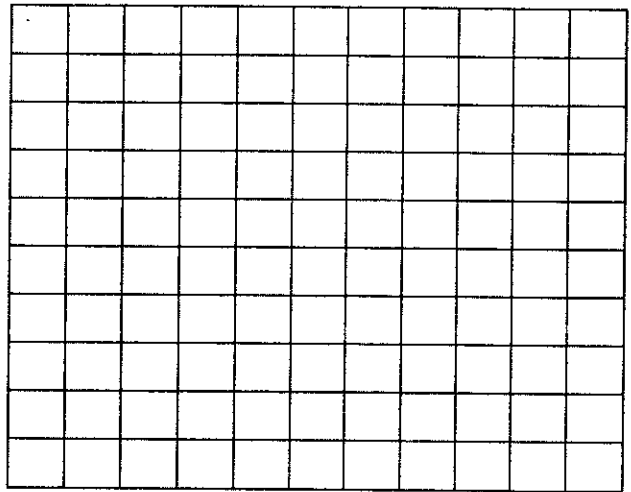
a) $x + y = 5$

x	y

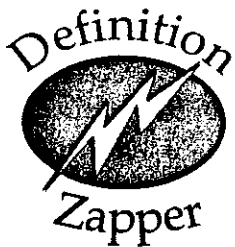


Pattern: _____

b) $x = y$

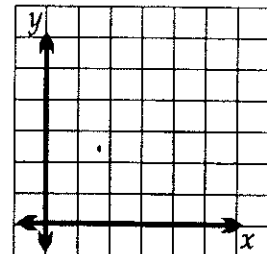


Pattern: _____



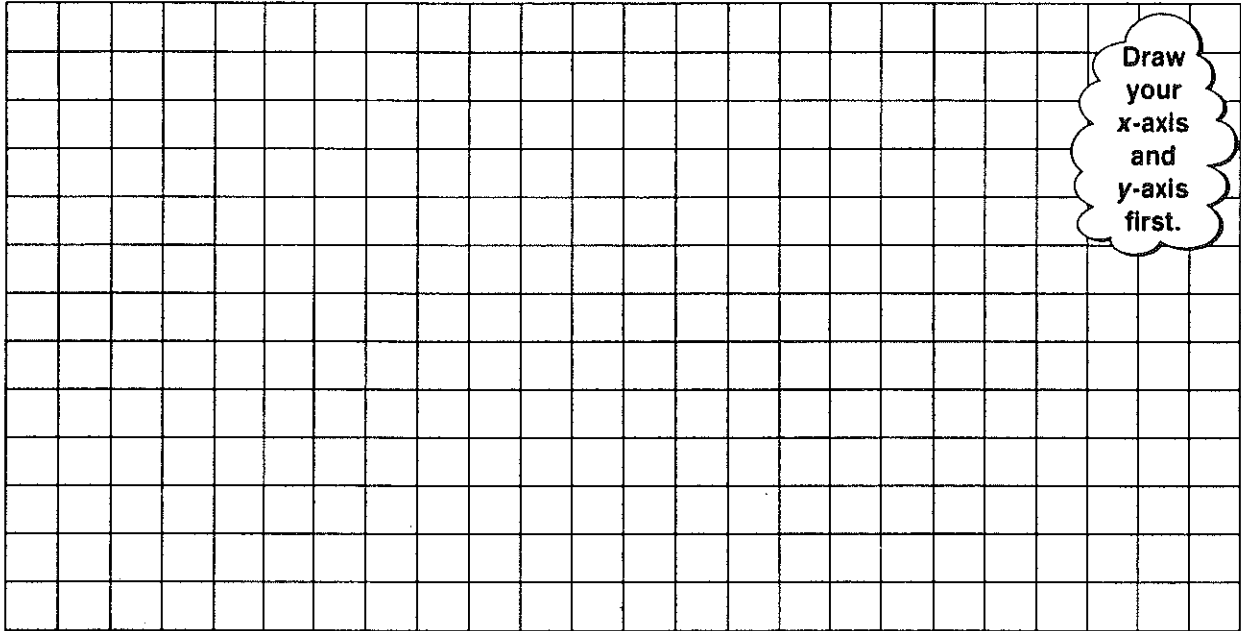
Two number lines called the x -axis and the y -axis meet at a point called the _____.

Hint: Its coordinates are $(0, 0)$.



Skill Builder

1. a) Graph these points: (4, 4), (6, 3), (8, 0).
- b) Join the points to form a straight line.
- c) Name 2 more ordered pairs on the line. _____ and _____



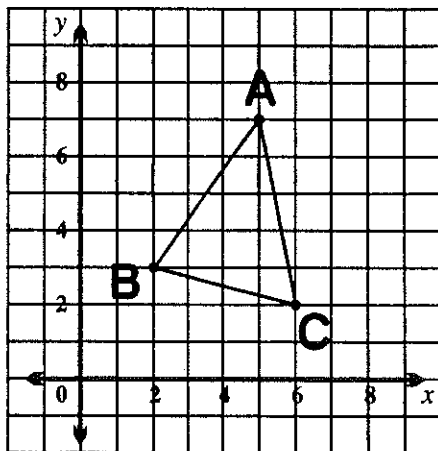
2. Calculate.

- | | | |
|----------------------------------|----------------------------------|-----------------------------------|
| a) $4 \times 2 \times 3 =$ _____ | b) $8 + 7 + 4 =$ _____ | c) $10 \times 2 \times 2 =$ _____ |
| d) $2 \times 4 \times 5 =$ _____ | e) $7 \times 9 \times 0 =$ _____ | f) $12 \div 3 \div 4 =$ _____ |
| g) $20 \div 4 - 5 =$ _____ | h) $5 + 8 - 2 =$ _____ | i) $9 - 6 + 7 =$ _____ |



NO CALCULATOR

3. Write the coordinates of the vertices of the triangle.

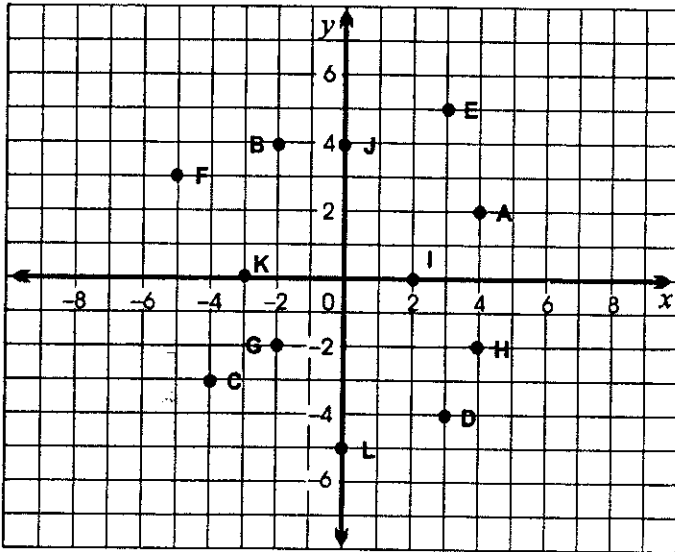


Vertex	Coordinates
A	(__, __)
B	(__, __)
C	(__, __)

7.8 Graphing Ordered Pairs

Practice

1. Name the coordinates (ordered pair) of each point on the grid.



A(,)

B(,)

2. Name the points with the following coordinates on the grid.

a) $(-3, 3)$ _____

b) $(4, 1)$ _____

c) $(-4, -2)$ _____

d) $(3, -3)$ _____

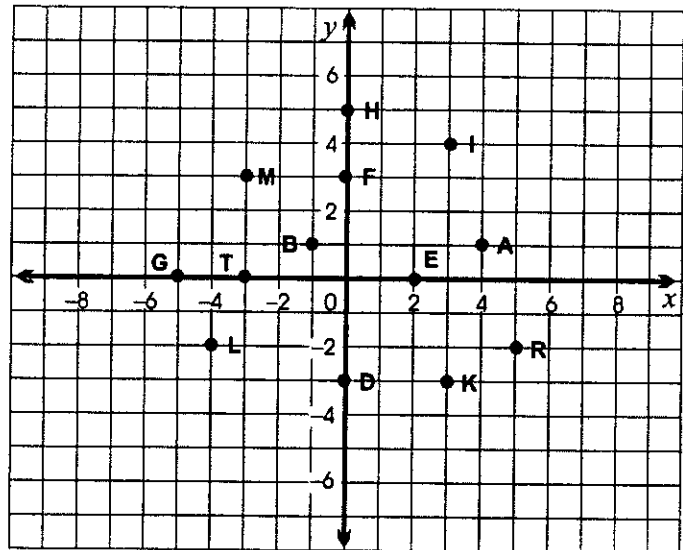
e) $(0, 3)$ _____

f) $(0, -3)$ _____

g) $(-1, 1)$ _____

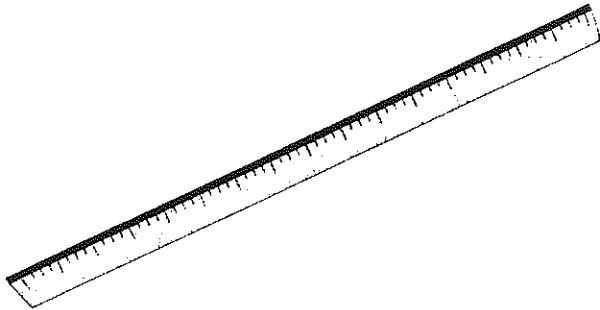
h) $(-5, 0)$ _____

i) $(0, 5)$ _____

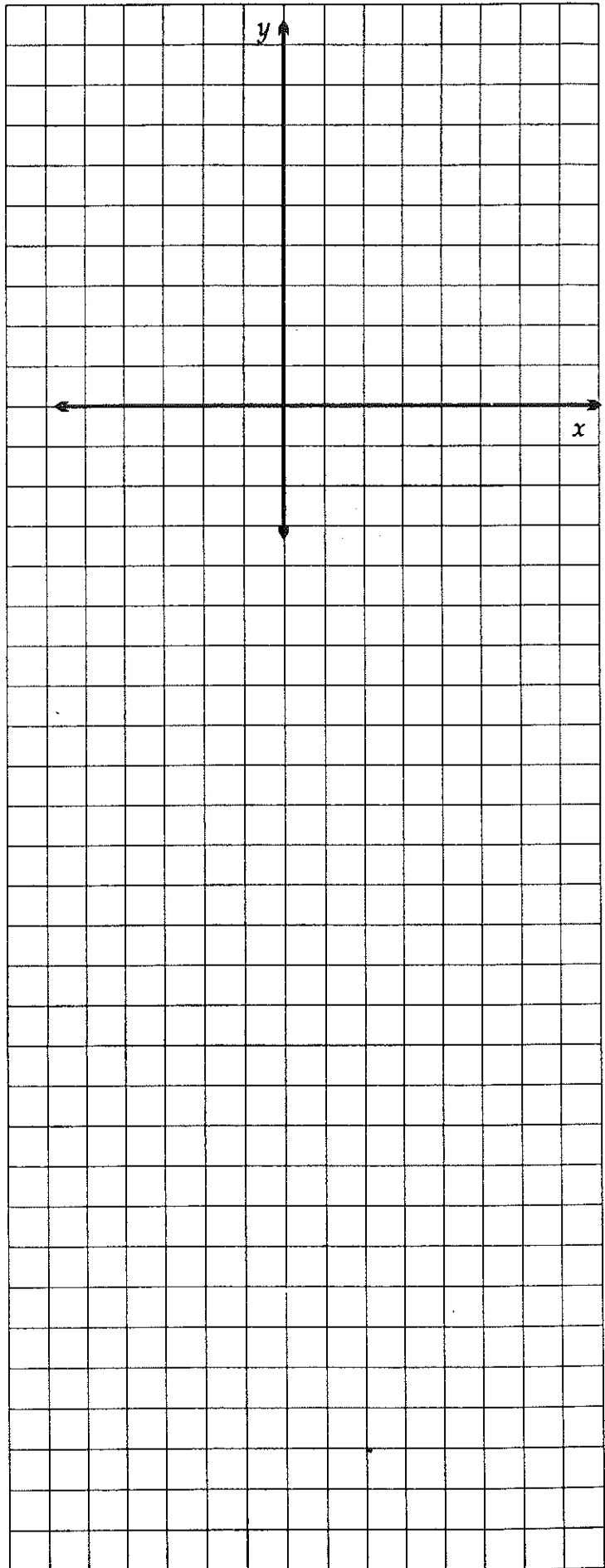


Problems and Applications

3. a) Plot the points $P(-2, 1)$, $Q(0, 4)$, $R(6, 4)$, and $S(4, 1)$ on the grid.
b) Join the points in order to form a figure.
c) Name the figure.



4. a) Plot the points $A(-4, 3)$, $B(-4, -3)$, $C(4, -3)$, $D(4, -1)$, $E(2, -1)$, and $F(2, 3)$ on a grid.
b) Join the points in order to form a figure.
c) Describe the figure.



5. a) Name the coordinates of each point.

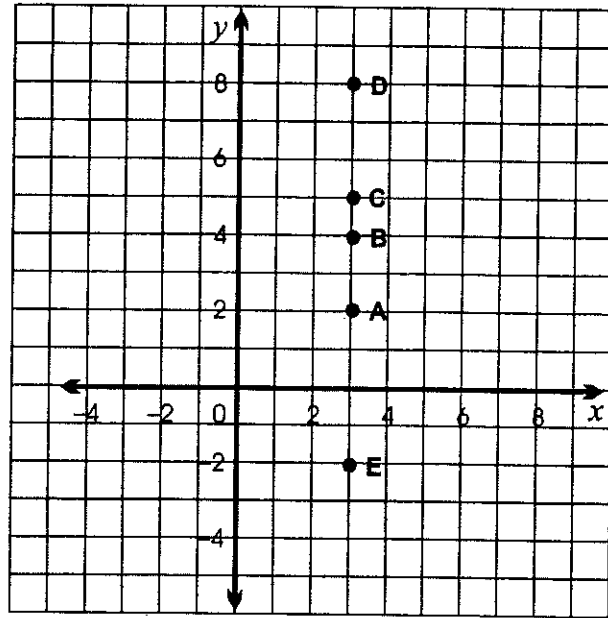
A(____, ____)

B(____, ____)

C(____, ____)

D(____, ____)

E(____, ____)



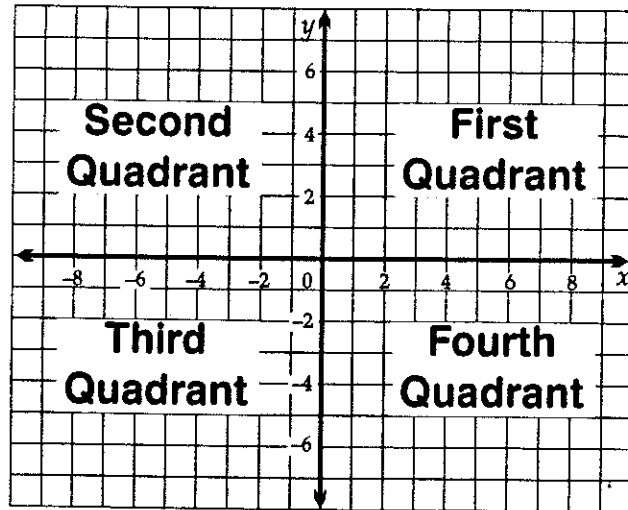
b) Join the points.

c) Is the x -coordinate the same in each point? _____

d) To which axis is this line parallel? _____

Use your dictionary.

6. The x -axis and y -axis divide the grid into 4 quadrants.



In which quadrant is each of the following points?

Plot them on the grid.

quadrants

a) K(4, 5) _____

b) N(1, -2) _____

c) M(-2, -4) _____

d) Q(-1, -1) _____

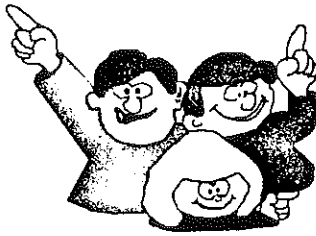
e) T(-4, 1) _____

f) W(5, 5) _____

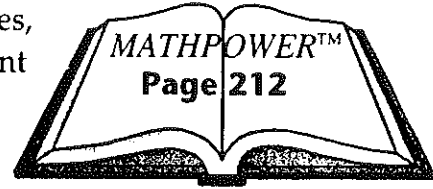
g) R(3, -5) _____

h) S(-3, 4) _____

LEARNING TOGETHER Interpreting Graphs



Work together with your classmates, using your *MATHPOWER™* student text, page 212.



Now, write the meaning of

a) interpolation _____

b) extrapolation _____

Skill Builder

1. Complete each table.

a) $2x - 1 = y$

x	y
0	
1	
2	

Substitute

$(2 \times 0) - 1 = \underline{\hspace{2cm}}$

$(2 \times 1) - 1 = \underline{\hspace{2cm}}$

$(2 \times 2) - 1 = \underline{\hspace{2cm}}$

b) $3x + 1 = y$

x	y
0	
1	
2	

2. Multiply.

a) $70 \times 3 = \underline{\hspace{2cm}}$

b) $20 \times 3 = \underline{\hspace{2cm}}$

c) $40 \times 6 = \underline{\hspace{2cm}}$

d) $700 \times 7 = \underline{\hspace{2cm}}$

e) $80 \times 2 = \underline{\hspace{2cm}}$

f) $100 \times 8 = \underline{\hspace{2cm}}$

g) $50 \times 5 = \underline{\hspace{2cm}}$

h) $10 \times 40 = \underline{\hspace{2cm}}$

i) $30 \times 2 = \underline{\hspace{2cm}}$

j) $100 \times 9 = \underline{\hspace{2cm}}$

k) $200 \times 2 = \underline{\hspace{2cm}}$

l) $60 \times 6 = \underline{\hspace{2cm}}$

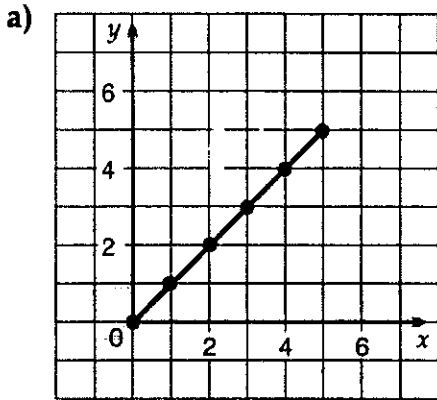


7.9 Graphing Relations

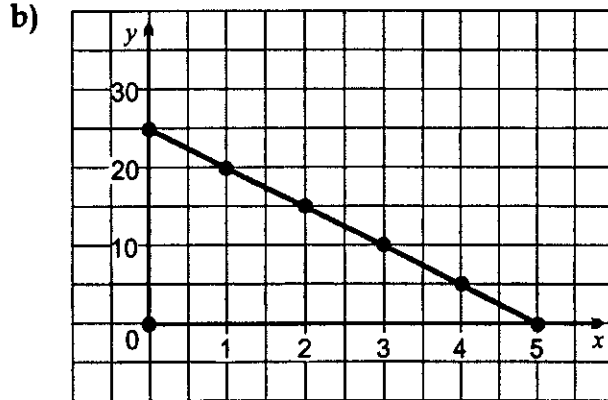
Practice

Points lie in a straight line.

1. Name the coordinates of the points for each linear relation.



_____, _____, _____,
 _____, _____, and _____.



_____, _____, _____,
 _____, _____, and _____.

2. (i) Complete each table of values.

(ii) Graph each relation.

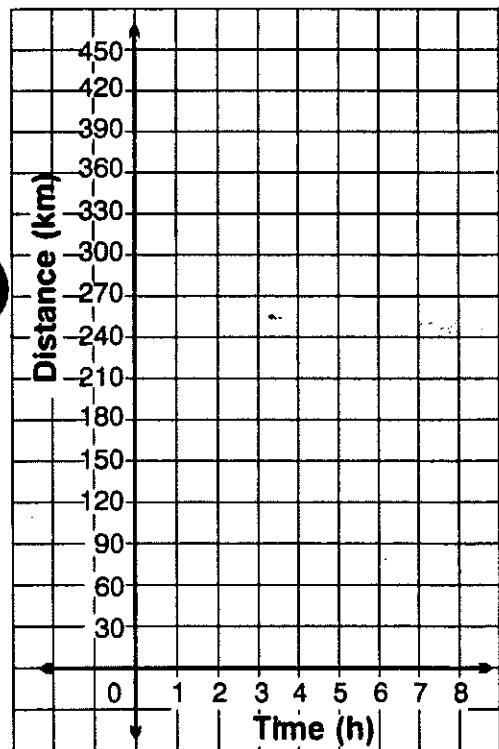


a)

Time (h)	Distance (km)
0	0
1	90
2	180
3	
4	
5	

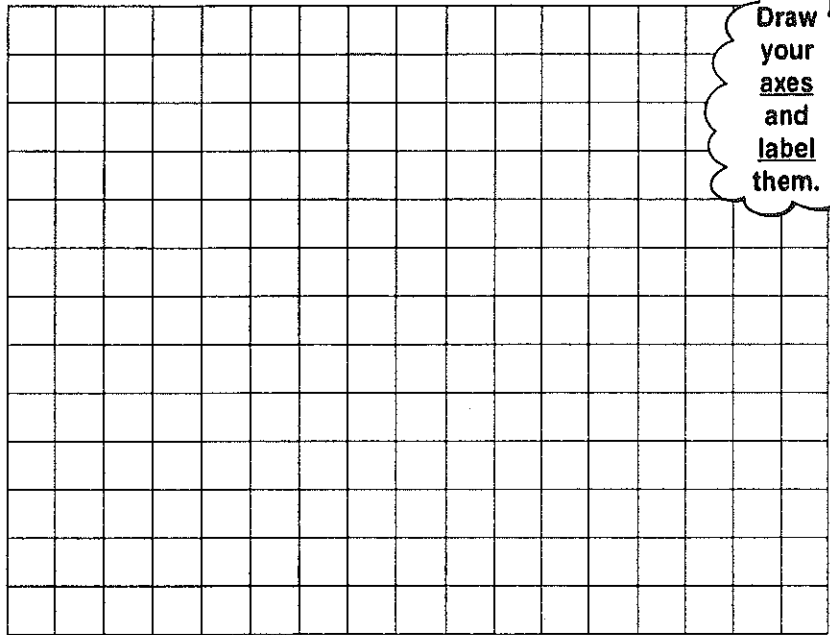
THINK:

- $90 \times 0 =$ _____
- $90 \times 1 =$ _____
- $90 \times 2 =$ _____
- $90 \times 3 =$ _____
- $90 \times 4 =$ _____
- $90 \times 5 =$ _____



b)

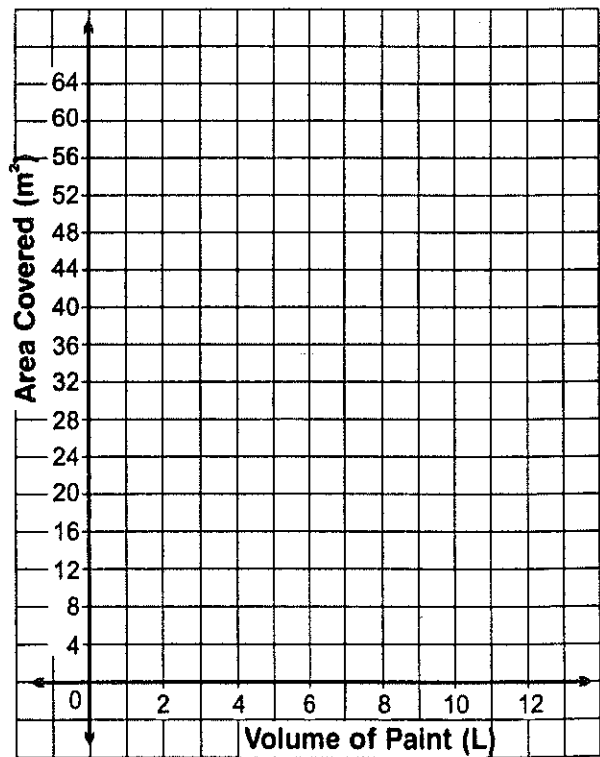
Time (h)	Cost (\$)
0	0
1	6.00
2	12.00
3	
4	
5	



Problems and Applications

3. This table of values shows the area covered by different volumes of paint.
- a) Graph the relation. (Join the points.)

Volume of Paint (L)	Area Covered (m ²)
2	16
4	32
6	48
8	64



- b) How many square metres can be covered by

(i) 1 L of paint? _____

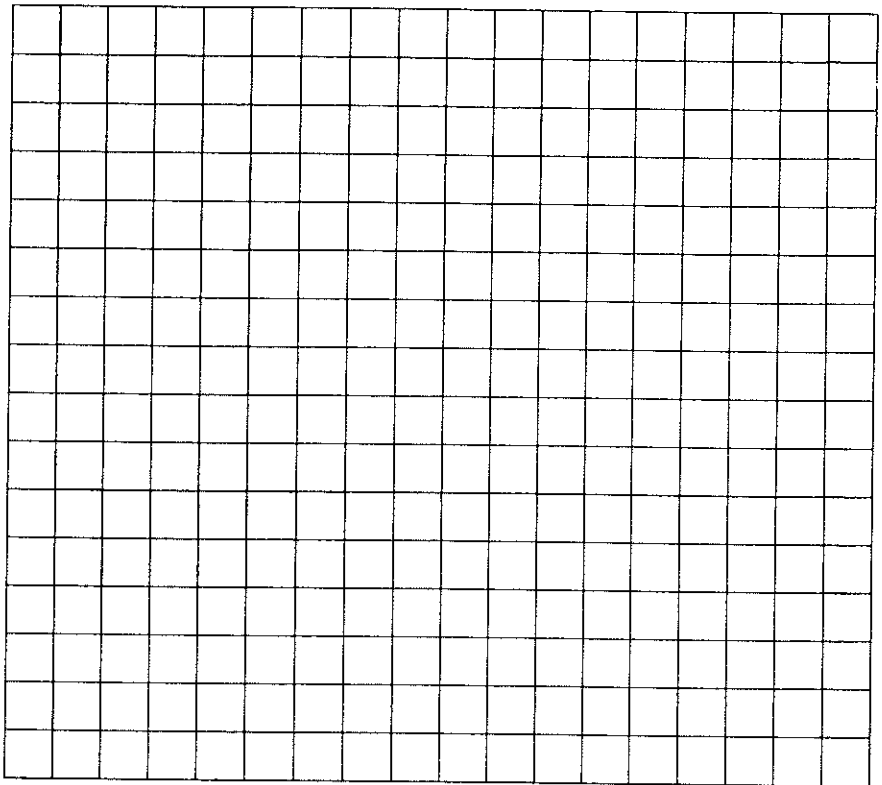
(ii) 10 L of paint? _____

(iii) 3 L of paint? _____

4. This table shows the cost for different quantities of Popsicles.

a) Graph the relation.

Number of Popsicles	Cost (in cents)
2	30
4	60
6	90



b) What is the price of

(i) 1 Popsicle? _____

(ii) 5 Popsicles? _____

(iii) 8 Popsicles? _____

c) How many Popsicles can you buy for \$1.50? _____

Skill Builder

HINT:
Substitute



1. Evaluate.

a) $x + 1$, when $x = 5$

$5 + 1 =$ _____

b) $3x$, when $x = 3$

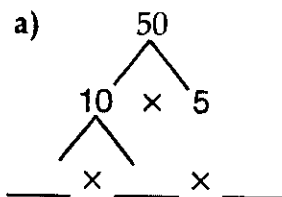
c) $x - 2$, when $x = 6$

d) $2x + 1$, when $x = 1$

e) $4x - 3$, when $x = 2$

2. Draw a factor tree for each of the following numbers.

a)



b)

16

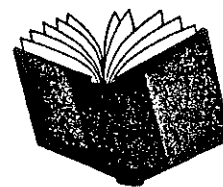
c)

24

d)

20

Review



1. Substitute 4 for x in each expression.

a) $3x = 3 \times 4$

b) $x + 3$

c) $x - 3$

= _____

d) $7 - x$

e) $2x + 2$

f) $3x - 1$

2. Evaluate the following for $x = 2$ and $y = 3$.

a) $x + y = 2 + 3$

b) $y - x =$

c) $2x - y =$

= _____

d) $2x + y =$

e) $3x - y =$

f) $\frac{x}{2} + y =$

3. To find the total cost (in dollars) of taking a car on a ferry, use the formula

$$45 + 7a + 4c$$

Number of adults

Number of children

What is the total cost of taking a car on a ferry with 2 adults and 3 children?

HINT:
Substitute
 $a = 2$
 $c = 3$

$$45 + 7a + 4c =$$



4. Choose an expression from the cloud to match each phrase.

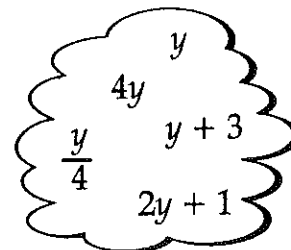
a) 3 more than y _____

b) 4 times y _____

c) y divided by 4 _____

d) y minus 3 _____

e) 2 times y , then increased by 1 _____



5. Complete the table.

	Expression	Written Phrase
a)	$x + 4$	
b)	$x - 3$	
c)	$x + 9$	a number increased by 9
d)	$3x$	
e)	$\frac{x}{3}$	
f)	$11 + x$	
g)	$2x - 1$	

6. Write an expression for each of the following.

a) three more than the width _____

b) four times the number of cans _____

c) the time increased by two $t + 2$

d) the number of pens divided by 5 _____

e) \$15 less than the price of the book _____

7. Solve each equation.

a) $x + 5 = 7$

$x =$ _____

b) $y + 11 = 13$

c) $w - 4 = 2$

d) $m - 6 = 4$

e) $3n = 15$

f) $5g = 25$

g) $\frac{x}{4} = 3$

h) $\frac{y}{10} = 5$

i) $y - 7 = 4$

j) $4c = 28$

k) $x + 6 = 11$

l) $\frac{x}{2} = 6$

Solve.

m) $2x + 1 = 5$

Guess	Substitute Into $2x + 1 = 5$	Check
$x = 0$	$(2 \times 0) + 1 = 1$	Too small
$x =$		

$x =$ _____

n) $3w - 2 = 7$

Guess		Check

8. The 3 diagrams below show how squares have been arranged.



Diagram 1

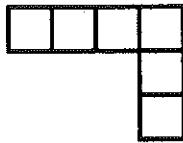


Diagram 2

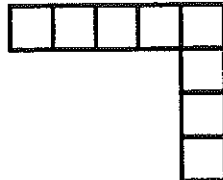


Diagram 3

a) Draw the next three diagrams.

b) Complete the table.

Diagram	1	2	3	4	5	6
Number of Squares						

c) Describe the relationship between the number of squares and the diagram.

d) How many squares are in the 7th diagram? _____

9. Complete these tables of values.

a)

x	$x + 5$
1	
2	
3	
4	

Substitute

$x + 5$

$1 + 5 = \underline{\quad}$

$\underline{\quad} + 5 = \underline{\quad}$

b)

x	$x - 1$
	0
	1
	2
	3

Substitute

c)

x	$2x + 3$
1	
2	
3	
4	

Substitute

$2x + 3$

$(2 \times 1) + 3 = \underline{\quad}$

$(2 \times \underline{\quad}) + 3 = \underline{\quad}$

d)

x	$3x - 2$
1	
2	
3	
4	

Substitute

10. A luncheon costs \$100 to rent the room plus \$10 per person for food.

To calculate the cost, use this formula:

$10n + 100$

Number of people

Complete this table of values.

Use the formula.

Number of People (n)	10	20	30	50
Cost (\$)				



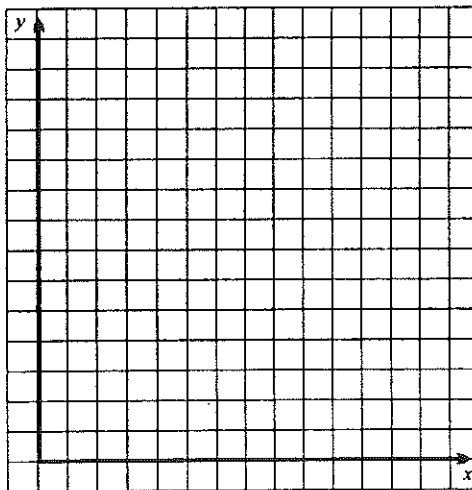
Substitute:

$10n + 100 = (10 \times 10) + 100$

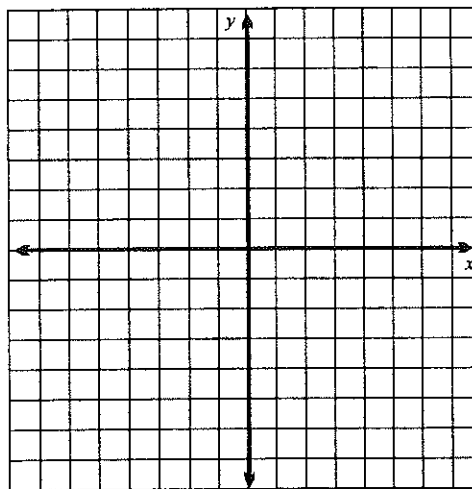
$= 100 + 100$

$= \underline{\quad}$

11. a) Plot the points
 $D(0, 0)$, $E(4, 4)$, $F(7, 4)$,
and $G(11, 0)$.
b) Join the points in order.
c) Name the figure formed.



12. a) Plot the points $A(-2, 2)$,
 $B(4, 2)$, $C(4, -3)$, and $D(-2, -3)$.
b) Join the points in order.
c) Name the figure formed.



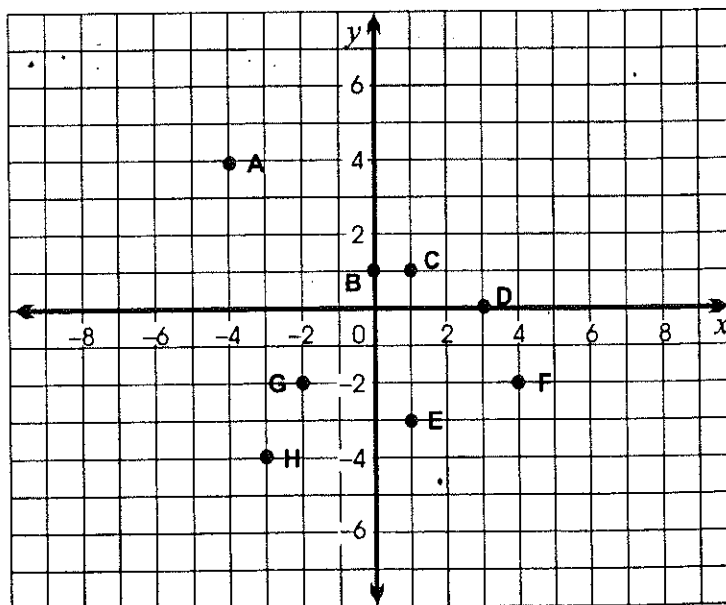
13. Write the coordinates (ordered pair) of each of the points shown in the graph.

$A(-4, \underline{\quad})$ E _____

B _____ F _____

C _____ G _____

D _____ H _____



14. (i) Complete the table of values.
 (ii) Write the ordered pairs.
 (iii) Graph each set of points.

a) $x + y = 8$

x	y
0	8
1	
2	
3	
4	

Substitute

$x + y = 8$

$0 + \square = 8$ **Ordered Pairs** $(0, 8)$

$1 + \square = 8$

b) $x - y = 2$

x	y
	0
	1
	2
	3
	4

Substitute

$\square - 0 = 2$ _____

$\square - 1 = 2$ _____

$\square - 2 = 2$ _____

$\square - 3 = 2$ _____

$\square - 4 = 2$ _____

c) $y = x - 1$

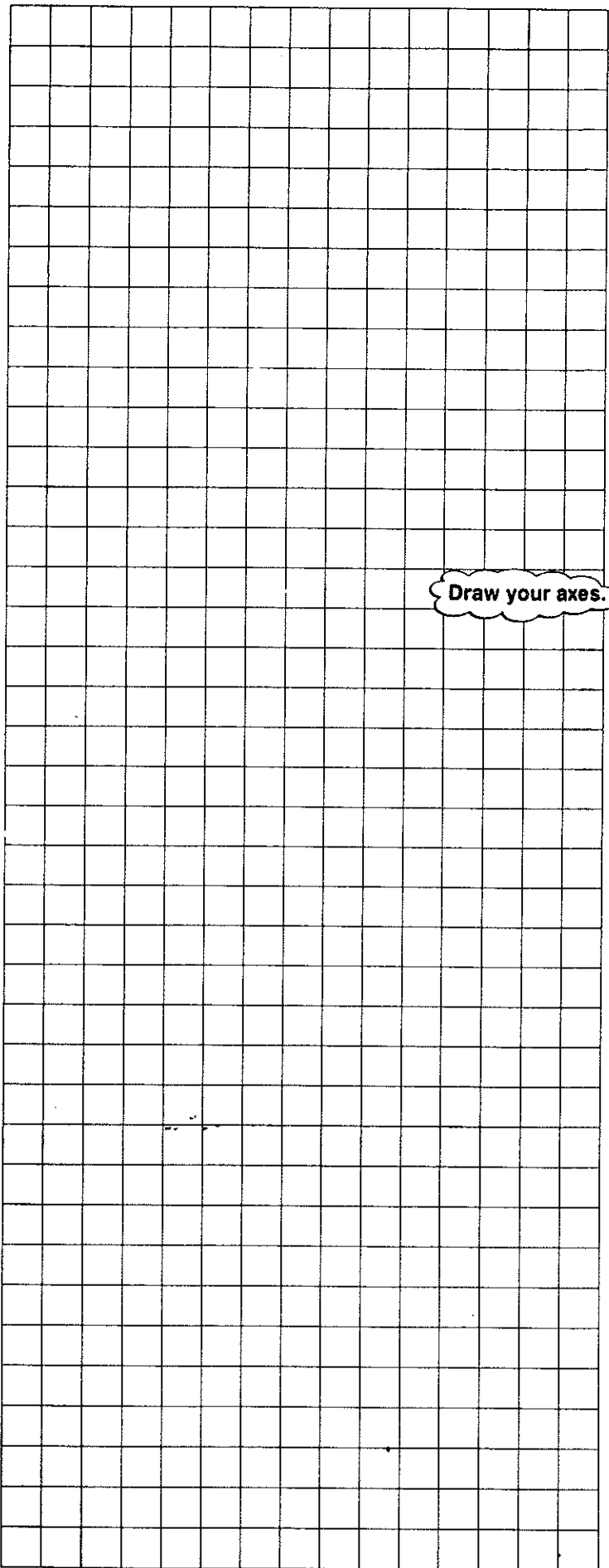
x	y
0	-1
1	
2	
3	
4	

Substitute

$\square = 0 - 1$ _____

$\square = 1 - 1$ _____

$\square = 2 - 1$ _____



15. (i) Complete these tables.
 (ii) Write the solutions as ordered pairs.

a) $x + y = 9$

x	y
1	
2	
3	
4	
5	
6	

Ordered Pairs

b) $x - y = 3$

x	y
3	
5	
7	
9	
11	
13	

Ordered Pairs

c) $2x + 1 = y$

x	y
1	3
2	
3	
4	
5	

Substitute

$(2 \times 1) + 1 =$ _____

Ordered Pairs

d) $3x - 2 = y$

x	y
0	-2
1	
2	
3	
4	

Substitute

$(3 \times 0) - 2 =$ _____

Ordered Pairs

Chapter Check



1. Evaluate the following expressions for $x = 2$ and $y = 1$.

Substitute

a) $x + y = 2 + 1$
 $=$ _____

b) $x - y =$

c) $2x + y =$

d) $x + 4y =$

e) $2x + 3y =$

f) $1 + x + 2y =$

2. Write an expression for each phrase.

a) a number multiplied by 15

b) a number divided by 3

c) a number increased by 9

d) twelve more than a number

 $x + 12$

e) a number decreased by 5

f) six times a number

3. Write each expression in words.

a) $y + 3$

b) $w - 11$

c) $7m$

d) $\frac{n}{4}$

e) $x - 3$

 a number decreased by three

f) $9 - y$

g) $4 + a$

4. Solve each equation.

a) $x - 3 = 4$

b) $d + 2 = 8$

c) $y - 9 = 4$

$x = \underline{\hspace{2cm}}$

d) $x + 3 = 12$

e) $6m = 36$

f) $\frac{b}{3} = 2$

g) $4x = 28$

h) $\frac{c}{3} = 9$

i) $x + 7 = 10$

5. The cost to have your house cleaned is calculated by using the formula $50 + 4n$.

Complete the table.

Use the formula.

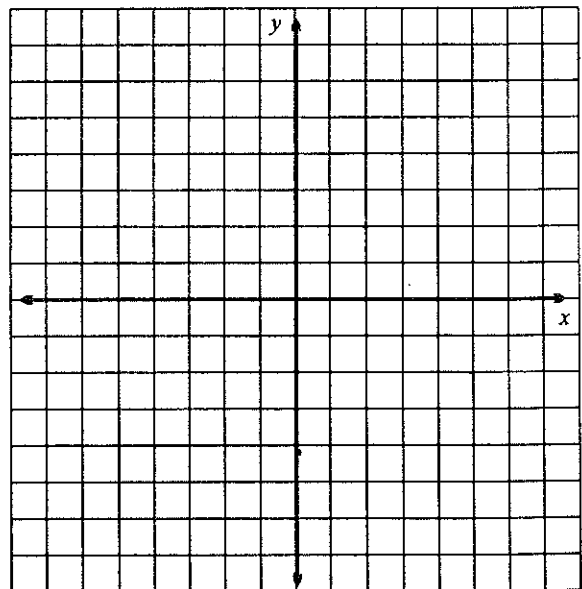
Number of hours to clean house

Time (h)	2	4	6	8
Cost (\$)				

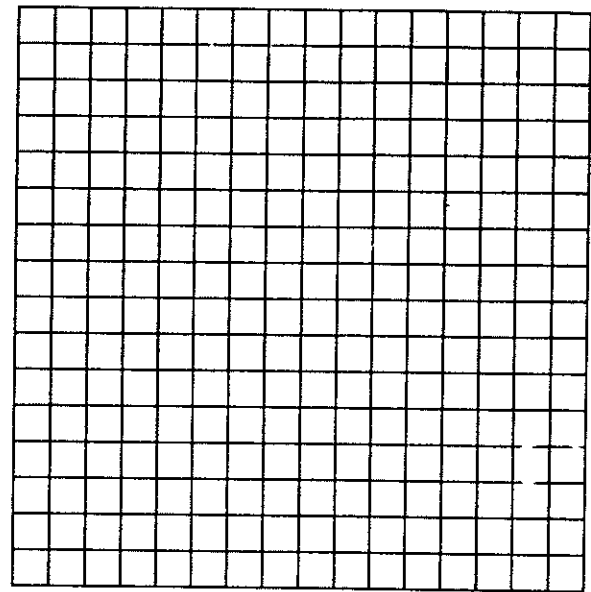


Substitute: $50 + 4n$
 $= 50 + (4 \times 2)$
 $= 50 + 8$
 $= \underline{\hspace{2cm}}$

6. a) Plot the points
 $A(-2, 2)$, $B(0, 5)$, $C(6, 5)$,
and $D(4, 2)$.
b) Join the points in order.
c) Name the figure formed.



7. a) Plot the points
 $W(4, 4)$, $X(4, -4)$, $Y(0, -4)$,
and $Z(0, 4)$.
b) Join the points in order.
c) Name the figure formed.



8. Complete these tables of values.

a)

x	$x + 7$
2	
3	
4	
5	

Substitute
 $x + 7 = 2 + 7$
 $=$ _____

b)

x	$2x - 3$
2	
3	
4	
5	

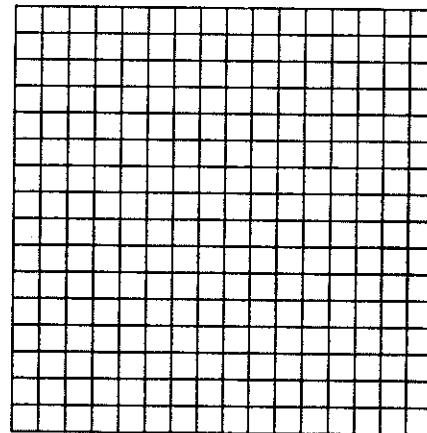
Substitute
 $2x - 3 = (2 \times 2) - 3$
 $= 4 - 3$
 $=$ _____

9. (i) Complete the table of values. (ii) Write the ordered pairs. (iii) Draw the graph.

a) $x + y = 7$

x	y
	1
	2
	3
	4
	5

Ordered Pairs

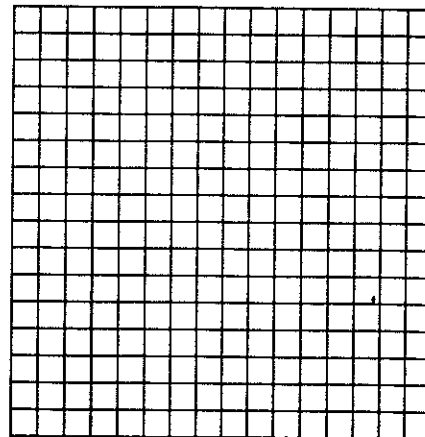


Draw your x-axis and y-axis first.

b) $y = x + 1$

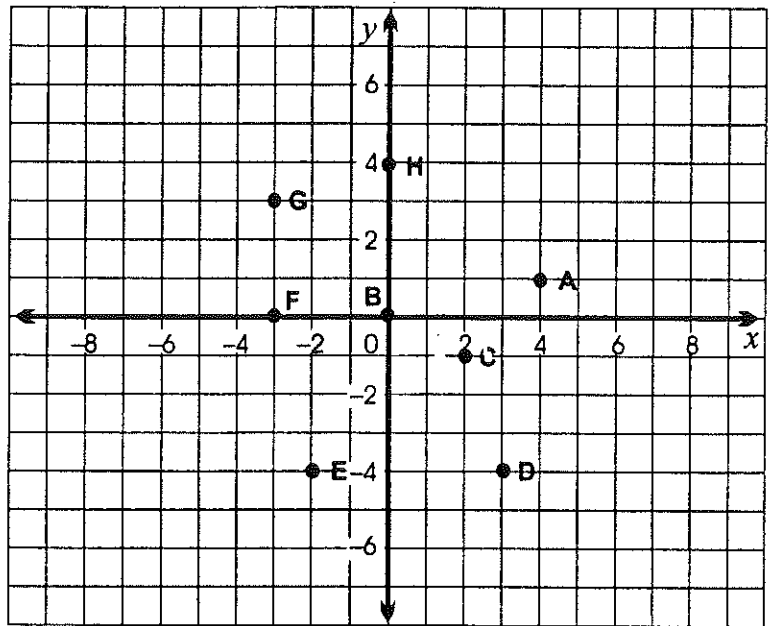
x	y
0	
1	
2	
3	

Ordered Pairs



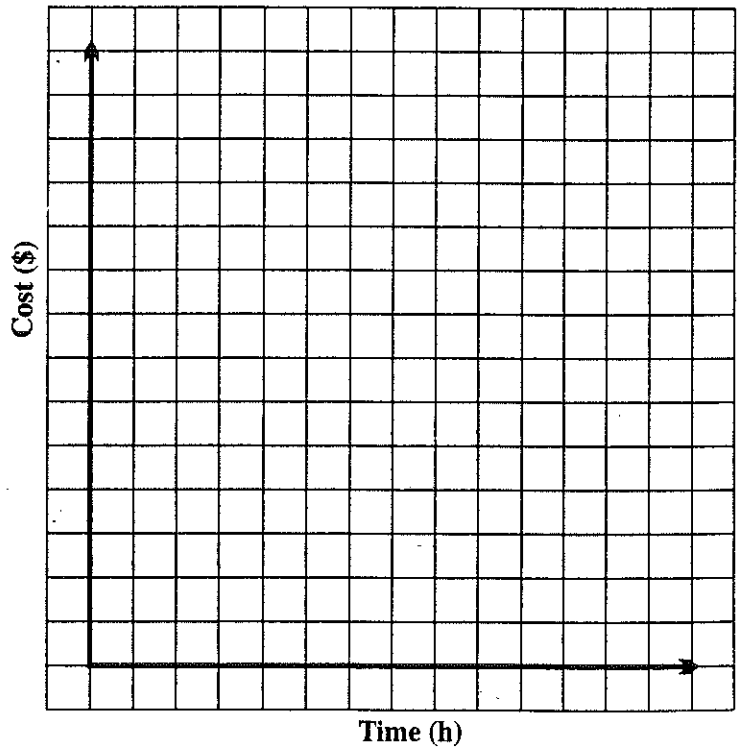
10. Name the coordinates (ordered pairs) of the points shown on the graph.

A(____, ____)



11. The table shows Galina's earnings.

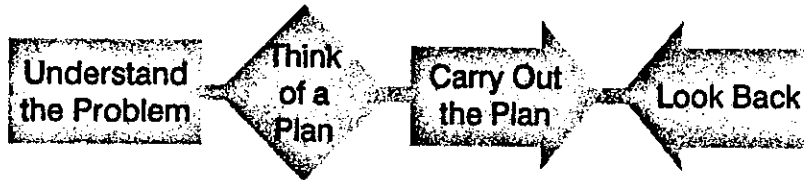
Time (h)	Earnings (\$)
1	10
2	20
3	30
4	
5	
6	



- Complete the table of values.
- Graph the relation.
- Join the points. Plot the points.
- Use the graph to find how much Galina earns in 8 h.

Problem Solving: Using the Strategies

Show your work on looseleaf.

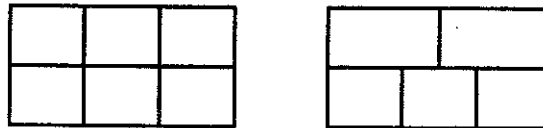


- The parking meter contains 21 coins in quarters and loonies. There was \$13.50 inside the meter. How many of each type of coin were there?

Set up a table.

Number of Quarters	Number of Loonies	Total Number of Coins	Total Value \$13.50	Check

- These are floor plans of two different houses.



Without lifting your pencil, draw one line that crosses each room only once.

- Joe bought three cartons of milk that cost \$2.69 each. What was his change from a \$10.00 bill?
- Ramon, Mary, Inga, and Paul go to the movies in a car. Two sit in the front and two sit in the back. Only Ramon and Mary can drive. In how many possible ways can they sit in the car? List the ways.

Multiply

- The numbers 5 and 6 are two consecutive numbers. The product of these numbers is 30. What are two consecutive numbers whose product is 182?
- Shirley left for school at 08:35 and returned home at 15:30. How long was Shirley away from home?

DATA BANK

Use the Data Bank on page 391 of your MATHPOWER™ student text.

- How much deeper than Lake Erie is Lake Huron?

- Which of the Great Lakes is the deepest? _____
- Which of the Great Lakes is the largest? _____

Answers CHAPTER 7 Patterns

Skill Builder page 343

1. a) 13 b) 16 c) 25 d) 27
2. a) 16 b) 20 c) 9 d) 28
3. a) 15 b) 54 c) 77 d) 84
e) 36 f) 64 g) 50 h) 21
4. a) 6 b) 4 c) 12 d) 12
e) 6 f) 5 g) 4 h) 10

Mental Math pages 344–345

1. a) 13 b) 18 c) 14
d) 13 e) 20 f) 19
2. a) 7 b) 4 c) 8
d) 7 e) 4 f) 9
3. a) 48 b) 63 c) 24
d) 70 e) 55 f) 24
4. a) 3 R1 b) 9 R2 c) 4 R3
d) 7 R1 e) 11 R1 f) 11 R1
5. a) 43 b) 20 c) 15 d) 14
6. a) 20 b) 28 c) 14 d) 4
7. a) 3.6 b) 2500 c) 4.15
d) 760 e) 20.6 f) 1500
g) 0.38 h) 52
8. a) 16 b) 8 c) 25
d) 36 e) 18 f) 15

Skill Builder page 345

1. a) +3 b) -3 c) +1
d) -4 e) +8 f) +12
g) +13 h) +10 i) +5
2. a) 47 b) 420 c) 66
d) 1000 e) 8 f) 34
g) 60 h) 120 i) 240
j) 60

7.1 Variables in Expressions pages 346–348

Practice

1. a) 9 b) 6 c) 3 d) 7
e) 0 f) 15 g) 7 h) 5
i) 6 j) 4
2. a) 12 b) 8 c) 2
d) 4 e) 9 f) 6
g) 18 h) 14 i) 7
3. a) 9 b) 20 c) 6 d) 6
e) 11 f) 2 g) 0
4. a) 3 b) 0 c) 4
d) 1 e) 3 f) 0
5. a) 5 b) 1 c) 7
d) 3 e) 15
6. a) 6.6 b) 1.8 c) 7.2
d) 12.6 e) 19.8

Problems and Applications

7. 10 m
8. a) \$40.00 b) \$80.00
9. Answers may vary.

Word Zapper page 349

Answers may vary.

Skill Builder page 349

1. a) 14 cm b) 10 cm²
2. a) 15 b) 20 c) 40 d) 30
e) 8 f) 16 g) 4 h) 2
3. a) 18 b) 40 c) 27 d) 16
e) 100 f) 49 g) 48 h) 20

7.2 Words and Symbols pages 350–352

Practice

1. a) $x + 5$ b) $x - 6$ c) $4n$
d) $\frac{x}{2}$ e) $n - 8$ f) $5 + y$
g) $9 - m$ h) $\frac{5}{x}$
2. a) a number increased by six
b) a number decreased by five
c) a number multiplied by four
d) a number multiplied by two
e) the sum of nine and a number
f) a number subtracted from seven
g) a number divided by three
h) seven divided by a number
i) a number divided by two, then decreased by three
j) the sum of eight and a number
3. a) $\frac{m}{4}$ b) $n + 2$ c) $10 - n$
d) $\frac{12}{x}$ e) $\frac{x}{2}$ f) $5x$
g) $x - 6$ h) $\frac{25}{x}$ i) $7x$

Problems and Applications

4. a) $h + 5$ b) $w - 6$ c) $10l$
d) $\frac{t}{3}$ e) $6n$ f) $n + 2$
g) $t = 10b$ h) $t = 2 + a$
5. a) 15, 20, 25, 30, 35, 40 b) 5n

Logic Zapper page 352

$5 + 3 = 8$ $9 - 7 = 2$
Answers may vary.

Skill Builder page 353

1. a) 7 b) 5 c) 2 d) 0
e) 11 f) 23 g) 13 h) 16
2. a) 3.3 b) 0.7 c) 9.3
3. a) 24 b) 36 c) 34 d) 44
e) 55 f) 23 g) 86 h) 43
i) 36 j) 125

7.3 Solving Equations pages 354–357

Practice

1. b) $5 - 5 = 10$, False
c) $3 \times 15 = 18$, False
d) $5 \times 4 = 20$, True
e) $\frac{15}{5} = 2$, False
f) $2 \times 3 = 6$, True
g) $2 \times 3 + 1 = 7$, True
h) $3 \times 4 - 2 = 10$, True
2. a) $x = 4$ b) $f = 1$ c) $m = 7$
d) $n = 5$ e) $y = 4$ f) $z = 4$
3. a) $x = 12$ b) $a = 10$ c) $z = 7$
d) $n = 8$ e) $w = 6$ f) $n = 4$
4. a) $n = 2$ b) $s = 5$
c) $x = 4$ d) $y = 4$
5. a) $x = 12$ b) $y = 8$ c) $c = 21$
d) $r = 16$ e) $m = 4$ f) $n = 18$
6. a) $x = 7$ b) $b = 6$ c) $m = 8$
d) $n = 25$ e) $a = 4$ f) $g = 6$
g) $y = 11$ h) $h = 12$
7. a) $n = 4$ b) $x = 3$ c) $p = 5$

Problems and Applications

8. Answers may vary.
9. a) \$20.25 b) 200 pages
10. 14 rides

Logic Zapper page 357

nephew

Skill Builder page 358

1. a) 7 b) 3 c) 1
d) 13 e) 21 f) 11
2. a) $n = 5$ b) $n = 7$ c) $n = 11$
d) $n = 13$ e) $n = 4$ f) $n = 5$
g) $n = 4$ h) $n = 3$
3. a) 10 b) 13 c) 25
d) 20 e) 5 f) 15

7.4 Developing Patterns pages 359–361

Practice

1. a) 140, 210, 280, 350, 420
b) multiply the time by 70
c) 6 min d) 12 min
e) (i) 1400 (ii) 4200
(iii) 8400
2. b) 4, 7, 10, 13, 16, 19
c) 3 d) 25
3. a) multiply the time by 60
b) $d = 60 \times t$
c) (i) 420 km (ii) 540 km

Problems and Applications

4. a) 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30
b) (i) 22 bricks (ii) 26 bricks

Skill Builder page 361

- a) 8, 10 b) 12, 15
c) 13, 15 d) 18, 22
- a) 56 000 b) 120 c) 61
d) 2.4 e) 6 f) 9

7.5 Tables of Values pages 362–363

- a) 6, 7, 8, 9, 10, 11; increase the number by 1
b) 3, 6, 9, 12, 15, 18; increases by 3
c) 9, 10, 11, 12, 13, 14; increases by 1
d) 3, 5, 7, 9, 11, 13; increases by 2
e) 1, 4, 7, 10, 13, 16; increases by 3

Problems and Applications

- a) \$45.00, \$90.00, \$135.00, \$180.00
b) $C = 45n$
- \$400.00, \$600.00, \$1200.00, \$2200.00
- b) 1, 4, 9, 16, 25 c) 36

Logic Zapper page 364

Gear 1: counterclockwise
Gear 3: counterclockwise

Skill Builder page 364

- a) $x = 7$ b) $x = 4$ c) $b = 8$
d) $n = 16$ e) $y = 3$ f) $x = 16$
g) $a = 11$ h) $b = 1$ i) $n = 9$
- a) 42, 420, 4200
b) 15, 150, 1500
c) 32, 320, 3200
d) 2, 20, 200
e) 16, 160, 1600
f) 1, 10, 100

7.6 Ordered Pairs pages 365–367**Practice**

- a) (0, 3), (1, 2), (2, 1), (3, 0)
b) (0, 0), (1, 1), (2, 2), (3, 3)
c) (0, 8), (1, 7), (2, 6), (3, 5)
d) (0, 2), (1, 3), (2, 4), (3, 5)
e) (0, 5), (1, 6), (2, 7), (3, 8)
f) (4, 0), (5, 1), (6, 2), (7, 3)
- a) (0, 8), (1, 7), (2, 6), (3, 5)
b) Answers may vary.
c) Answers may vary.
d) Answers may vary.
e) (5, 0), (6, 1), (7, 2), (8, 3)
f) (11, 1), (12, 2), (13, 3), (14, 4)
- a) $x + y = 6$
b) $x - y = 1$ or $y + 1 = x$ or $x = y + 1$
c) $y - x = 1$ or $y = x + 1$ or $x + 1 = y$

Problems and Applications

- a) (1, 5), (2, 10), (3, 15), (4, 20)
b) $c = 5n$ c) \$1.00

Definition Zapper page 367

ordered pair, coordinates

Calculator Zapper page 368

$11^2, 19^2, 29^2, 41^2$
Add 8, 10, 12, 14, etc., then square.

Skill Builder page 368

- a) $x = 6$ b) $y = 2$ c) $a = 9$
d) $n = 15$ e) $g = 9$ f) $r = 10$
- a) 16 b) 2 c) 32
d) 8 e) 7 f) 2

7.7 The Coordinate Plane pages 369–372**Practice**

- a) D b) B c) I
d) J e) E f) F
g) G h) C i) H
- a) P(0, 7) b) W(6, 6) c) N(0, 3)
d) A(6, 4) e) C(1, 2) f) V(8, 8)
g) S(2, 5) h) M(8, 0) i) Q(2, 0)
j) T(10, 4) k) R(3, 6)

Problems and Applications

- a) square b) triangle
c) square d) rectangle
- trapezoid 5. line
- a) straight line b) straight line

Definition Zapper page 372

origin

Skill Builder page 373

- Answers may vary.
- a) 24 b) 19 c) 40
d) 40 e) 0 f) 1
g) 0 h) 11 i) 10
- A(5, 7), B(2, 3), C(6, 2)

7.8 Graphing Ordered Pairs pages 374–376**Practice**

- A(4, 2), B(-2, 4), C(-4, -3),
D(3, -4), E(3, 5), F(-5, 3),
G(-2, -2), H(4, -2), I(2, 0),
J(0, 4), K(-3, 0), L(0, -5)
- a) M b) A c) L
d) K e) F f) D
g) B h) G i) H

Problems and Applications

- parallelogram 4. L shape
- a) A(3, 2), B(3, 4), C(3, 5), D(3, 8),
E(3, -2)
c) yes d) y-axis
- a) first b) fourth c) third
d) third e) second
f) first g) fourth h) second

Skill Builder page 377

- a) -1, 1, 3 b) 1, 4, 7
- a) 210 b) 60 c) 240
d) 4900 e) 160 f) 800
g) 250 h) 400 i) 60
j) 900 k) 400 l) 360

7.9 Graphing Relations pages 378–380**Practice**

- a) (0, 0), (1, 1), (2, 2),
(3, 3), (4, 4), (5, 5)
b) (0, 25), (1, 20), (2, 15), (3, 10),
(4, 5), (5, 0)
- a) 270, 360, 450
b) 18.00, 24.00, 30.00

Problems and Applications

- b) (i) 8 m^2 (ii) 80 m^2
(iii) 24 m^2
- b) (i) 15¢ (ii) 75¢
(iii) \$1.20
c) 10 Popsicles

Skill Builder page 380

- a) 6 b) 9 c) 4
d) 3 e) 5
- a) $2 \times 5 \times 5$ b) $2 \times 2 \times 2 \times 2$
c) $2 \times 2 \times 2 \times 3$ d) $2 \times 2 \times 5$

Review pages 381–387

- a) 12 b) 7 c) 1
d) 3 e) 10 f) 11
- a) 5 b) 1 c) 1
d) 7 e) 3 f) 4
- \$71.00
- a) $y + 3$ b) $4y$ c) $\frac{y}{4}$
d) $y - 3$ e) $2y + 1$
- a) a number increased by 4
b) a number decreased by 3
d) 3 times a number
e) a number divided by 3
f) 11 increased by a number
g) two times a number, then decreased by 1
- a) $w + 3$ b) $4n$
d) $\frac{n}{5}$ e) $p - 15$
- a) $x = 2$ b) $y = 2$ c) $w = 6$
d) $m = 10$ e) $n = 5$ f) $g = 5$
g) $x = 12$ h) $y = 50$ i) $y = 11$
j) $c = 7$ k) $x = 5$ l) $x = 12$
m) $x = 2$ n) $w = 3$
- b) 4, 6, 8, 10, 12, 14
c) multiply the diagram number by 2 and add 2
d) 16
- a) 6, 7, 8, 9 b) 1, 2, 3, 4
c) 5, 7, 9, 11 d) 1, 4, 7, 10
- 200, 300, 400, 600
- c) trapezoid 12. c) rectangle
- A(-4, 4), B(0, 1), C(1, 1),
D(3, 0), E(1, -3), F(4, -2),
G(-2, -2), H(-3, -4)
- a) (1, 7), (2, 6), (3, 5), (4, 4)
b) (2, 0), (3, 1), (4, 2), (5, 3), (6, 4)
c) (0, -1), (1, 0), (2, 1), (3, 2), (4, 3)

15. a) (1, 8), (2, 7), (3, 6),
 (4, 5), (5, 4), (6, 3)
 b) (3, 0), (5, 2), (7, 4),
 (9, 6), (11, 8), (13, 10)
 c) (1, 3), (2, 5), (3, 7),
 (4, 9), (5, 11)
 d) (0, -2), (1, 1),
 (2, 4), (3, 7), (4, 10)

Chapter Check pages 388–391

1. a) 3 b) 1 c) 5
 d) 6 e) 7 f) 5
2. a) $15x$ b) $\frac{x}{3}$ c) $x + 9$
 e) $x - 5$ f) $6x$
3. a) a number increased by 3
 b) a number decreased by 11
 c) a number multiplied by 7
 d) a number divided by 4
 f) 9 decreased by a number
 g) 4 increased by a number
4. a) $x = 7$ b) $d = 6$ c) $y = 13$
 d) $x = 9$ e) $m = 6$ f) $b = 6$
 g) $x = 7$ h) $c = 27$ i) $x = 3$
5. 58, 66, 74, 82
6. c) parallelogram
7. c) rectangle
8. a) 9, 10, 11, 12 b) 1, 3, 5, 7
9. a) (6, 1), (5, 2), (5, 4), (4, 3), (2, 5)
 b) (0, 1), (1, 2), (2, 3), (3, 4)
10. A(4, 1), B(0, 0), C(2, -1), D(3, -4),
 E(-2, -4) F(-3, 0), G(-3, 3),
 H(0, 4)
11. a) 40, 50, 60 d) \$80.00

Problem Solving: Using the Strategies
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1. 11 loonies and 10 quarters
 3. \$1.93 4. 12 ways
 5. 13 and 14 6. 6 h and 55 min

DATA BANK page 392

1. 165 m 2. Superior
 3. Superior

