

PEARSON

# Math Makes Sense

6

## Practice and Homework Book

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PEARSON



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**PEARSON**  


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# To the Teacher

This Practice and Homework Book provides reinforcement of the concepts and skills explored in the *Pearson Math Makes Sense 6* program.

There are two sections in the book. The first section follows the sequence of *Math Makes Sense 6 Student Book*. It is intended for use throughout the year as you teach the program. A two-page spread supports the content of each core lesson in the Student Book.

## In each Lesson:

Quick Review summarizes the math concepts and terminology of the Student Book lesson.

The right page is the "homework" page, to be completed by the student with the assistance of a family member.

**UNIT 1**

STUDENT BOOK

**2**

LESSON

## Patterns from Tables

**Quick Review**

This Input/Output machine divides each input by 2, then adds 3.

The pattern rule that relates the input to the output is: Divide the input by 2. Then add 3.

We can use this rule to predict the output for any input.

For an input of 70, the output is:  $70 \div 2 + 3 = 38$

Input	Output
20	13
30	18
40	23
50	28
60	33

**Try These**

1. Each table of values shows the input and output from a machine with 1 operation. Write the number and the operation in each machine.

a)

Input	Output
2	4
4	8
6	12
8	16
10	20

b)

Input	Output
24	6
20	5
16	4
12	3
8	2

**Practice**

1. Each table shows the input and output from a machine with 2 operations.

For each table, write the numbers and the operations in the machine.

Input	Output
4	25
5	32
6	39
7	46

Input	Output
50	20
55	22
60	24
65	26

Input	Output
7	26
8	28
9	30
10	32

2. Write the pattern rule that relates the input to the output for each table in question 1.

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

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

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

3. This table shows the input and output from a machine with 2 operations.

a) Write the numbers and the operations in the machine.

Input	Output
25	15
30	18
35	21

b) Write the next 3 input and output numbers.

c) Predict the output when the input is 100.

**Stretch Your Thinking**

The first 5 input numbers for the machine are 2527, 2577, 2627, 2677, and 2727.

The first 5 output numbers for the machine are 5061, 5161, 5261, 5361, and 5461.

Write the numbers and the operations in the machine.

Try These presents questions the student can use to check understanding of the math concepts and skills in each lesson.

Stretch Your Thinking presents an extension question.

## Math at Home

The second section of the book, on pages 113 to 124, consists of 3 pull-out **Math at Home** magazines. These fun pages contain intriguing activities, puzzles, rhymes, and games to encourage home involvement. The perforated design lets you remove, fold, and send home this eight-page magazine after the student has completed units 3, 6, and 8.

## To the Family

This book will help your child practise the math concepts and skills that have been explored in the classroom. As you assist your child to complete each page, you have an opportunity to become involved in your child's mathematical learning.

The left page of each lesson contains a summary of the main concepts and terminology of the lesson. Use this page with your child to review the work done in class. The right page contains practice.

Here are some ways you can help:

- With your child, read over the Quick Review. Encourage your child to talk about the content and explain it to you in his or her own words.
- Read the instructions with (or for) your child to ensure your child understands what to do.
- Encourage your child to explain his or her thinking.
- Some of the pages require specific materials. You may wish to gather items such as a centimetre ruler, index cards, a measuring tape, scissors, cubes numbered from 1 to 6, and paper clips.

Many of the Practice sections contain games that will also improve your child's math skills. You may have other ideas for activities your child can share with the rest of the class.

The **Math at Home** pull-out pages 113 to 124 provide more fun activities.

# Input/Output Machines



## Quick Review

This is an **Input/Output machine**.  
It can be used to make a growing pattern.



Each input is multiplied by 9 to get the output.

If you input 1, the output is 9.

If you input 2, the output is 18.

Input	Output
1	9
2	18
3	27
4	36
5	45

↙ The pattern rule for the output is:  
Start at 9. Add 9 each time.

## Try These

1. Complete the table of values for each Input/Output machine.

a)



Input	Output
17	
16	
15	
14	
13	
12	
11	

b)



Input	Output
40	
36	
32	
28	
24	
20	
16	

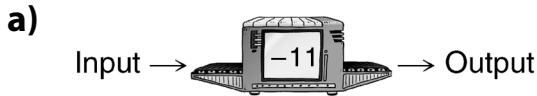
2. Look at the tables of values in question 1. Write the pattern rule for each group of terms.

a) the output numbers in part a) \_\_\_\_\_

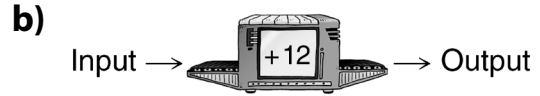
b) the input numbers in part b) \_\_\_\_\_

## Practice

1. Complete the table of values for each Input/Output machine.

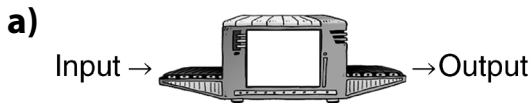


Input	Output
93	
90	
87	
84	
81	



Input	Output
305	
310	
315	
320	
325	

2. Look at the tables of values. Write the number and the operation in each machine.



Input	Output
840	42
800	40
760	38
720	36
680	34



Input	Output
11	143
20	260
29	377
38	494
47	611

## Stretch Your Thinking

The table of values shows the Input/Output from a machine.

- Write the number and operation for the machine. \_\_\_\_\_
- Write the pattern rule for the input numbers.  
\_\_\_\_\_
- Write the pattern rule for the output numbers. \_\_\_\_\_

Input	Output
3456	1152
3531	1177
3606	1202
3681	1227
3756	1252

# Patterns from Tables



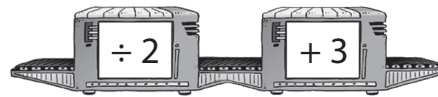
## Quick Review

This Input/Output machine divides each input by 2, then adds 3.

The pattern rule that relates the input to the output is: Divide the input by 2. Then add 3.

We can use this rule to predict the output for any input.

For an input of 70, the output is:  
 $70 \div 2 + 3 = 38$



Input	Output
20	13
30	18
40	23
50	28
60	33

## Try These

1. Each table of values shows the input and output from a machine with 1 operation. Write the number and the operation in each machine.

a)



Input	Output
2	4
4	8
6	12
8	16
10	20

b)



Input	Output
24	6
20	5
16	4
12	3
8	2

2. Write the pattern rule that relates the input to the output for each table of values in question 1.

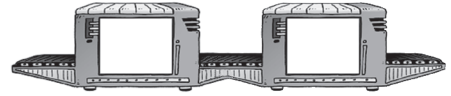
a) \_\_\_\_\_

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



## Practice

1. Each table shows the input and output from a machine with 2 operations.



For each table, write the numbers and the operations in the machine.

a)

Input	Output
4	25
5	32
6	39
7	46

b)

Input	Output
50	20
55	22
60	24
65	26

c)

Input	Output
7	26
8	28
9	30
10	32

2. Write the pattern rule that relates the input to the output for each table in question 1.

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_

3. This table shows the input and output from a machine with 2 operations.

- a) Write the numbers and the operations in the machine.

\_\_\_\_\_

- b) Write the next 3 input and output numbers.

- c) Predict the output when the input is 100.

\_\_\_\_\_

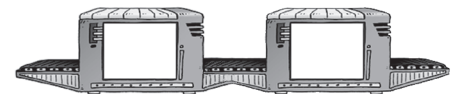
Input	Output
25	15
30	18
35	21

## Stretch Your Thinking

The first 5 input numbers for the machine are:  
2527, 2577, 2627, 2677, and 2727.

The first 5 output numbers for the machine are:  
5061, 5161, 5261, 5361, and 5461.

Write the numbers and the operations in the machine.



# Using Variables to Describe Patterns



## Quick Review

The pattern rule for the output is:

Start at 5. Add 2 each time.

This suggests the input numbers are multiplied by 2.

Multiply input 3 by 2:  $3 \times 2 = 6$

To get output 9, add 3.

The pattern rule that relates the input to the output is: Multiply by 2. Then add 3.

We can use a variable in an expression to represent this rule.

Let the letter  $n$  represent any input number.

Then, the expression  $2n + 3$  relates the input to the output.

Input	Output
1	5
2	7
3	9
4	11
5	13

Input	Output
1	$2 \times 1 + 3 = 5$
2	$2 \times 2 + 3 = 7$
3	$2 \times 3 + 3 = 9$
4	$2 \times 4 + 3 = 11$
5	$2 \times 5 + 3 = 13$
⋮	⋮
$n$	$2 \times n + 3$

## Try These

1. Complete each table of values, then write an expression that relates the input to the output.

a)

Input	Output
1	3
2	8
3	13
4	18
5	23
6	
7	
8	
9	

b)

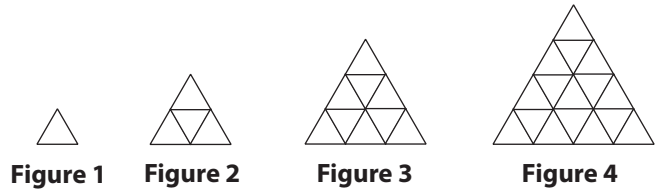
Input	Output
1	9
2	14
3	19
4	24
5	29
6	
7	

c)

Input	Output
0	4
1	10
2	16
3	22
4	28
5	

## Practice

1. Here is a pattern of triangles.



- a) Complete the table.  
 b) Write the pattern rule.  
 \_\_\_\_\_  
 c) Write an expression for the pattern.  
 \_\_\_\_\_  
 d) Find the number of triangles in the 8th figure.  
 \_\_\_\_\_

Figure	Number of Triangles
1	
2	
3	
4	

2. For each table of values, write an expression to represent the pattern.

a)

Input	Output
1	1
2	5
3	9
4	13

\_\_\_\_\_

b)

Input	Output
2	4
3	9
4	14
5	19

\_\_\_\_\_

## Stretch Your Thinking

- a) Use the expression  $7n + 10$  to complete the table.  
 b) Write and solve a story problem that matches the pattern.

Number	Amount (\$)
0	
1	
2	
3	
4	

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Plotting Points on a Coordinate Grid



## Quick Review

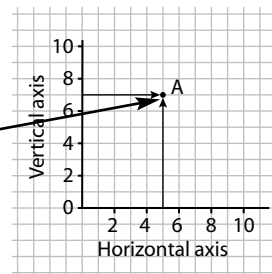
- We use an **ordered pair** to describe the **coordinates** of a point on a grid.

The coordinates of point A are (5, 7).

The **origin** is the point where the horizontal and vertical axes meet.

In an ordered pair:

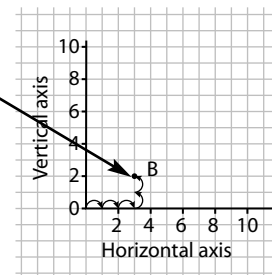
- The first number tells the horizontal distance from the origin.
- The second number tells the vertical distance from the origin.



- The coordinates of point B are (3, 2).

To **plot** point B:

Start at 0, move 3 squares right, then move 2 squares up.



## Try These

1. a) Name the letter on the grid represented by each ordered pair.

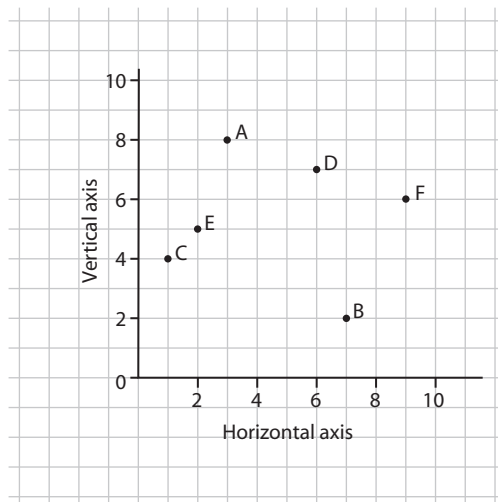
(2, 5) \_\_\_\_\_ (6, 7) \_\_\_\_\_ (1, 4) \_\_\_\_\_

(9, 6) \_\_\_\_\_ (7, 2) \_\_\_\_\_ (3, 8) \_\_\_\_\_

- b) Plot each point on the grid.

G(5, 4), H(10, 10), I(0, 9),

J(0, 2), K(8, 1), L(10, 4)



## Practice

1. Plot each set of ordered pairs on the coordinate grid.  
Join the points in order.  
Join the last point to the first point.  
Name each polygon you have drawn.

A:  $(8, 6), (6, 6), (6, 8), (8, 8)$

\_\_\_\_\_

B:  $(0, 3), (4, 0), (6, 0), (2, 3)$

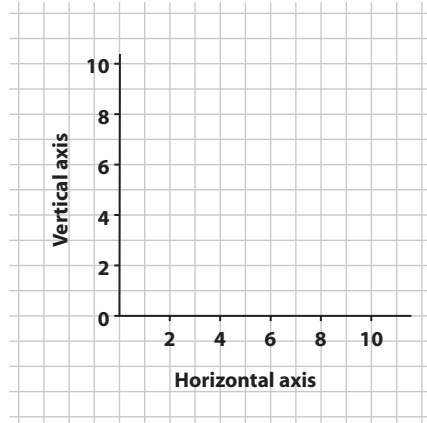
\_\_\_\_\_

C:  $(1, 6), (1, 10), (4, 10), (4, 6)$

\_\_\_\_\_

D:  $(7, 1), (6, 3), (8, 5), (10, 3), (9, 1)$

\_\_\_\_\_

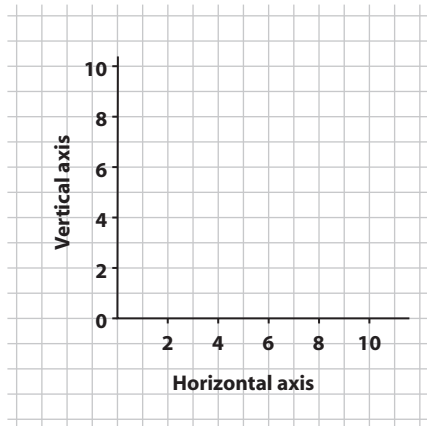


2. Plot 6 points on the grid.  
Label the points A to F.  
Record the ordered pairs.

A: \_\_\_\_\_ B: \_\_\_\_\_

C: \_\_\_\_\_ D: \_\_\_\_\_

E: \_\_\_\_\_ F: \_\_\_\_\_



## Stretch Your Thinking

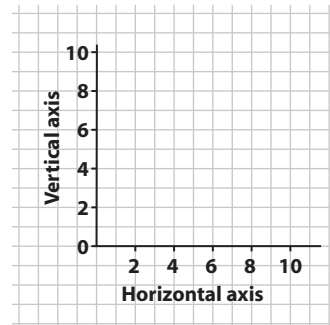
- $(2, 5)$  and  $(7, 5)$  are 2 vertices of a parallelogram with area 10 square units.  
Plot the points for the 2 given vertices.  
What are the coordinates of the other vertices?  
Give as many answers as you can.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# Drawing the Graph of a Pattern



## Quick Review

Here are some ways to represent a pattern.

- Model the pattern on grid paper.

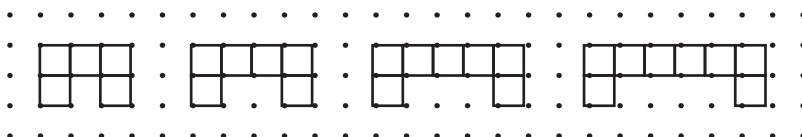
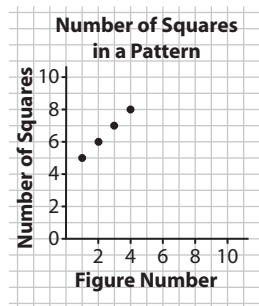


Figure 1      Figure 2      Figure 3      Figure 4

- Make a table.

Figure Number	Number of Squares	Ordered Pair
1	5	(1, 5)
2	6	(2, 6)
3	7	(3, 7)
4	8	(4, 8)

- Draw a graph.



## Try These

1. Henry made this pattern.

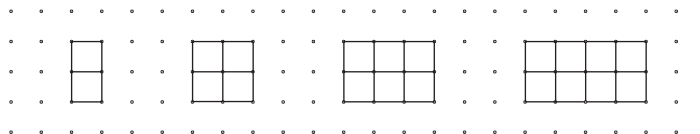
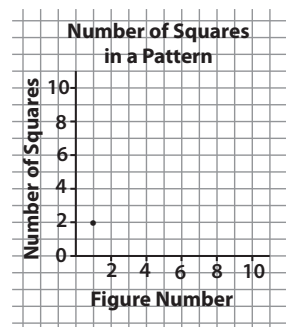


Figure 1      Figure 2      Figure 3      Figure 4

- a) Complete the table.

Figure Number	Number of Squares	Ordered Pair
1	2	(1, 2)

- b) Graph the pattern



## Practice

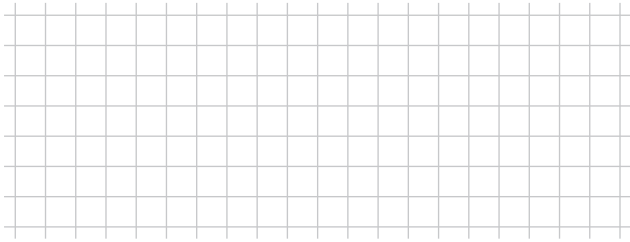
1. a) Describe the relationship shown in the table.

<b>Figure Number</b>	1	2	3	4	5
<b>Number of Squares</b>	1	3	5	7	9

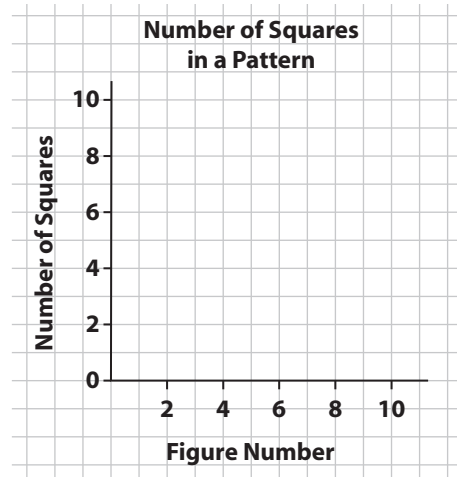
\_\_\_\_\_

\_\_\_\_\_

- b) Draw squares on the grid to model the pattern.



- c) Graph the pattern.
- d) How many squares are needed for Figure 10?



- e) Which figure has 29 squares?
- f) Which figure has 51 squares?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. Draw a pattern to model the data in the table.

<b>Figure Number</b>	1	2	3	4
<b>Number of Triangles</b>	1	2	4	8



## Stretch Your Thinking

Use the table in question 2.

How many triangles are in Figure 10? \_\_\_\_\_

Which figure has 8192 triangles? \_\_\_\_\_