Important Concepts . . .

Preview Review

Mathematics Grade 7 TEACHER KEY

W2 - Lesson 1: Table of Values and Graphing Linear Equations

Important Concepts of Grade 7 Mathematics

W1 - Lesson 1 .....Divisibility Rules
W1 - Lesson 2 ..... Decimal Numbers
W1 - Lesson 3 .....Fractions
W1 - Lesson 4 ..... Improper Fractions, Mixed Numbers,Percents, and Decimals
W1 - Lesson 5 .....Integers, Number Lines, and Sequencing
W1 - Quiz

W2 - Lesson 1 ..... Table of Values and Graphing Linear Equations
W2 - Lesson 2 .....Modeling Expressions, Equations, and the Preservation of Equality
W2 - Lesson 3 ..... Algebra and Linear Equations
W2 - Lesson 4 .....Statistics
W2 - Lesson 5 ..... Circle Graphs and Calculating Probability
W2 - Quiz

W3 - Lesson 1 ..... Circles
W3 - Lesson 2 ..... Area of Triangles and Parallelograms
W3 - Lesson 3 .....Line Segments
W3 - Lesson 4 ..... Parts and Plotting on a Cartesian Plane
W3 - Lesson 5 .....Transformations
W3 - Quiz

Materials Required

Math Set
Calculator

No Textbook Required

This is a stand-alone course.

Mathematics Grade 7
Version 6
Preview/Review W2 - Lesson 1
ISBN 1-894894-75-8

Publisher: Alberta Distance Learning Centre
Written by: Sandy
Reviewed by: Barb Philips

Project Coordinator: Donna Silgard
Preview/Review Publishing Coordinating Team:
Laura Renkema and Nicole McKeand

Alberta Distance Learning Centre has an Internet site that you may find useful. The address is as follows: **http://www.adlc.ca**

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

Preview/Review Concepts for Grade Seven Mathematics

Teacher Key

W2 – Lesson 1:

Table of Values and Graphing Linear Equations

Introductory Information for Teachers

Preview/Review courses are aimed mainly at students who have completed the regular course but who need to review some of the material before beginning the next grade. Other students may find Preview/Review courses useful in preparing for the new concepts they will study in their next grade.

No Preview/Review course is intended to replace the regular course because each covers only what the writers have decided are the top 15 concepts from the Program of Studies for that course.

Preview/Review materials are intended for use by teachers and students in one-subject and one-grade classrooms. This Preview/Review course contains fifteen lessons in three sections. Each section has five lessons. A short quiz is provided at the end of each section to test student knowledge of the material studied. In a classroom the course will likely be completed in three weeks.

This Preview/Review course is written to be stand-alone. There is no textbook required.

W2 – Lesson 1: Table of Values and Graphing Linear Equations

Objective:

- *I can use a linear relation to represent a pattern.*

Finding A Pattern


Figure 1

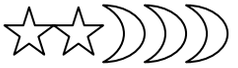


Figure 2


Figure 3

Question:

What if someone asked you to draw the 9th figure in this series?

Look for the *relationship* or pattern between the figure numbers and each figure.

Relation: when two numbers or things are *related* in some way.

Example: Canada → Dollar

Japan → Yen

→ The only thing that changes are the number of stars

→ The number of stars is the same as the figure number

→ The moons stay the same in each figure.

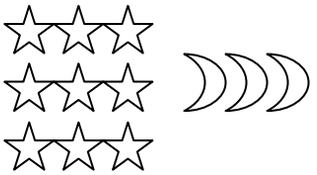
Pattern rule:

Figure x = x stars + 3 moons

Variable: the part of the pattern that varies or changes; usually represented by a letter..

Answer:

Figure **9**: **9** stars + 3 moons



How many stars would Figure 15 have? ***15***

Practice

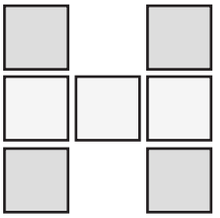


Figure 1

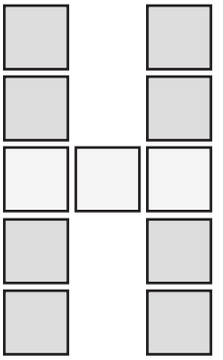


Figure 2

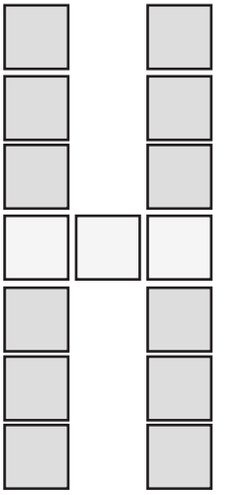


Figure 3

1. Write a pattern rule for the figures.

   Figure x = 4x + 3

2. How many dark tiles would there be in Figure 27?

   27 × 4 = 108

3. How many total tiles will there be in Figure 13?

   4(13) + 3 = 55 tiles

Objective:

- *I can create a table of values for a given linear relation.*

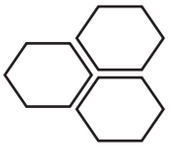


Figure 1

Figure 2

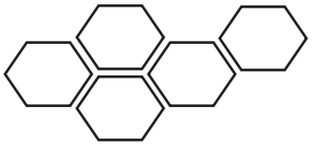


Figure 3

Shape Number (*n*)	Number of Hexagons (*x*)
1	3
2	4
3	5
4	***6***
5	***7***
6	***8***
10	***12***
24	***26***

Creating a pattern rule from a chart

→ The relationship is: **shape number + 2**

→ The pattern rule: **Number of Hexagons x = n + 2**

→ Using this pattern rule: **Number of Hexagons in Shape number 4 = 4 + 2 = 6**

Complete the remainder of the chart using the pattern rule.

Practice:

1.

Figure 1

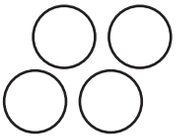


Figure 2

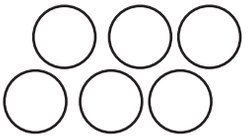


Figure 3

Pattern Number (n)	Number of circles (x)
1	2
2	4
3	6
4	8
5	**10**
12	**24**
25	**50**
37	**74**

a. What is a possible pattern rule?

Number of circles in Figure n = 2*n*

b. Complete the table of values using the rule.

2. Use the pattern rule given at the top of the table to complete the tables.

n = p - 1	
Pattern Number (*p*)	Number of circles (n=*p-1*)
1	**0**
2	**1**
3	**2**
4	**3**
5	**4**
10	**9**
50	**49**

n = 2p	
Pattern Number (*p*)	Number of circles (n=2 *p*)
1	**2**
2	**4**
3	**6**
4	**8**
5	**10**
10	**20**
50	**100**

n = 2p - 1	
Pattern Number (*p*)	Number of circles (n= 2*p-1*)
1	**0**
2	**3**
3	**5**
4	**7**
5	**9**
10	**19**
50	**99**

Objective:

- *I can use a linear relation to create a table of values and then graph it*

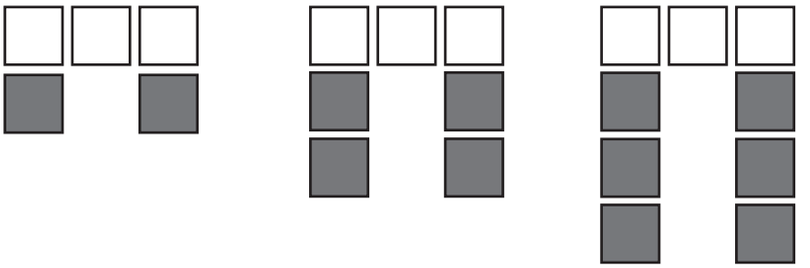
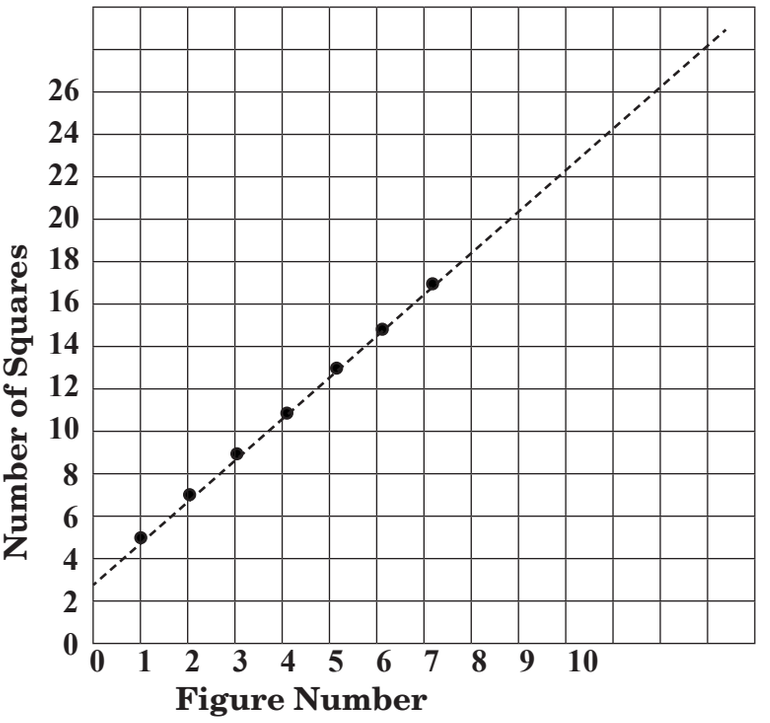


Figure 1 Figure 2 Figure 3

→ The pattern rule: Number of boxes in Fig. x = 2x + 3

→ A table of values for the figures above:

Figure Number	Number of squares
1	5
2	7
3	9
4	11
5	13
6	15
7	17
8	19

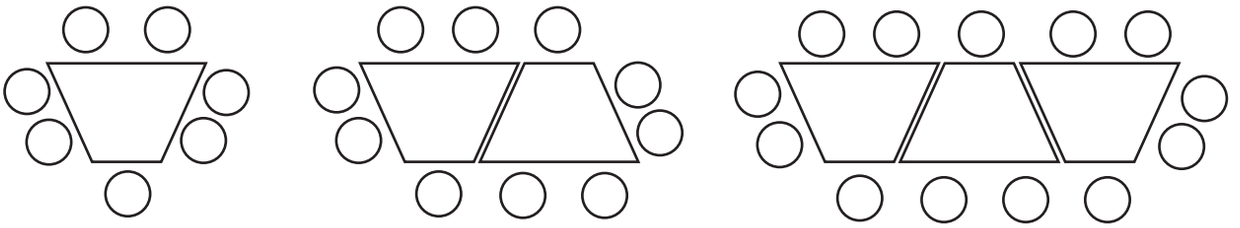


By extrapolating (extending) the line, we can use the graph to predict how many squares would be in other figures. Predict how many squares would be in Fig. 12.

27 squares

Practice:

a. Patrick is arranging tables and chairs for a banquet.

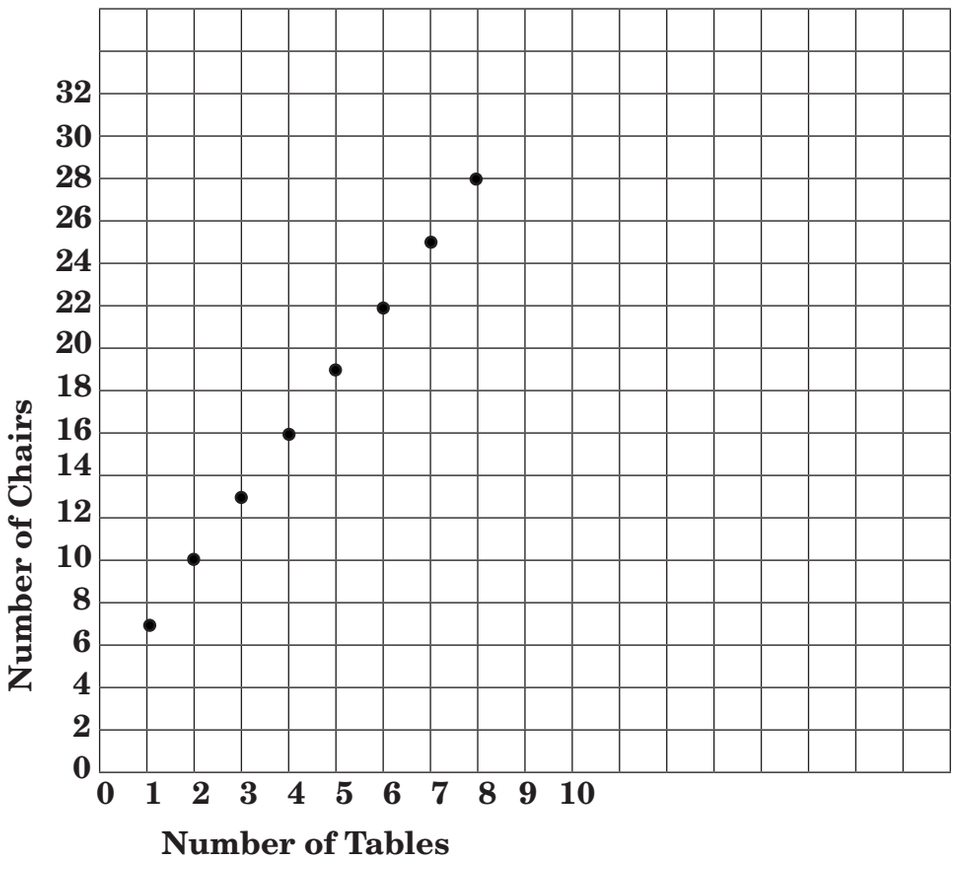


What is the pattern rule describing the number of chairs, c, needed for each number of tables, t? **c = 3t + 4**

b. Complete the table, and graph the results

c. If Patrick has 10 tables lined up, how many chairs would he need? **34**

Number of Tables (t)	Number of Chairs (c)
1	**7**
2	**10**
3	**13**
4	**16**
5	**19**
6	**22**
7	**25**
8	**28**



Objective:

- *I can describe the patterns found in the graph to draw conclusions.*

Graph each of the following table of values in different colours on the same grid. Make a key to identify each line produced.

a.

$y = n$	
n	***y***
1	**1**
2	**2**
3	**3**
4	**4**
5	**5**

b.

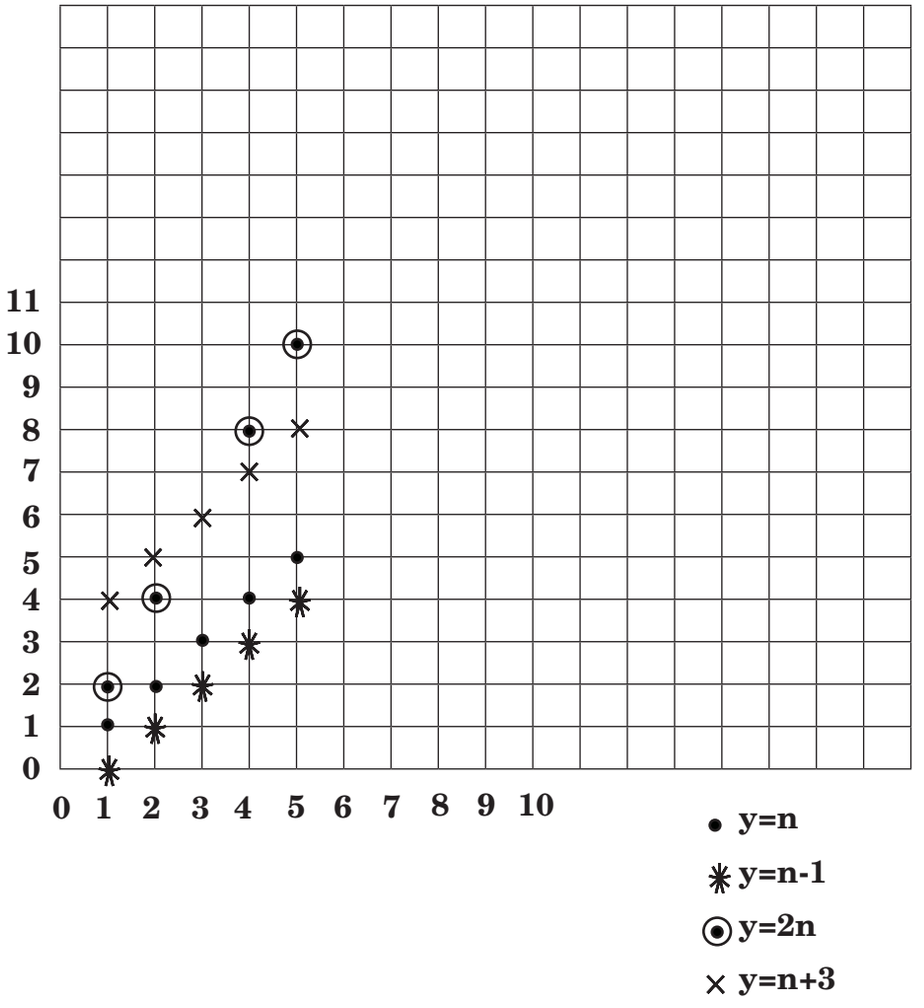
$y = n + 3$	
n	***y***
1	**4**
2	**5**
3	**6**
4	**7**
5	**8**

c.

$y = 2n$	
n	***y***
1	**2**
2	**4**
3	**6**
4	**8**
5	**10**

d.

$y = n - 1$	
n	***y***
1	**0**
2	**1**
3	**2**
4	**3**
5	**4**



a. What is the difference between graphs a. and b?

Same graph 3 spaces higher

b. What is the difference between graphs a. and c?

Graph c is 2 times steeper.

c. What is the difference between graphs a. and d?

Same graph 1 space lower

Summary and Practice:

- *Using what you've learned, answer the following questions.*

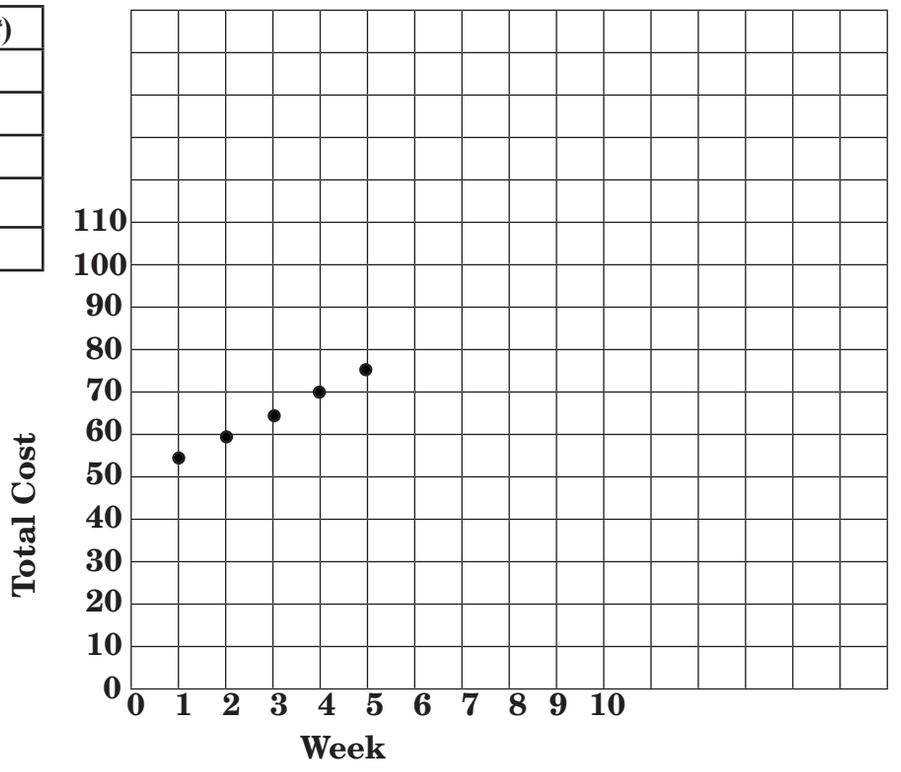
1. Hilary started with $50 in her piggy bank and saved $5 each week from her allowance.

   a. What is the pattern relation that would describe the amount of money (t) in the bank for n *weeks*?

   Total money = 5n + 50

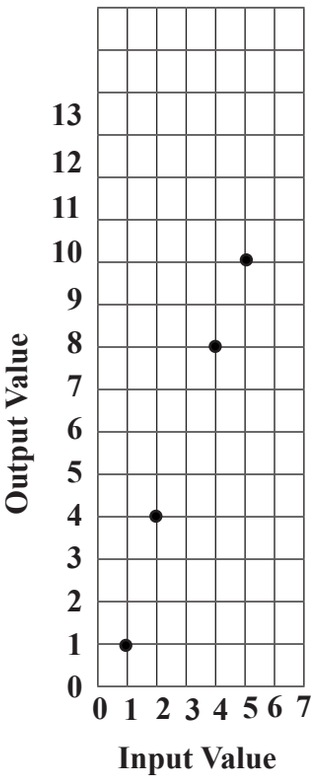
   b. Complete a table of values for this relation, and graph the relation.

Week (n)	Money (t)
1	**55**
2	**60**
3	**65**
4	**70**
5	**75**



   c. After 20 weeks, how much money would Hilary have in the bank?

   5(20) + 50 = $150



2. Consider the following graph.

   a. What is the relation represented by this graph?

      Output value = 2x - 1

   b. The data for input value 3 is missing. What should be the output value for input value 3?

      Output value = 5

   c. What would be the output value for an input value of 20?

      Output value = 39

3. A pizza with cheese costs $8.50. Each additional topping is $0.50.

   a. Write a relation for the cost of a pizza with *n* number of extra toppings.

      Cost = 0.5n + 8.50

   b. What is the cost of a pizza with 8 extra toppings?

      Cost = 0.5(8) + 8.50 = $12.50

   c. On the first Thursday of the month the pizzas go on sale for $5.00. What would the new relation look like?

      Cost = 0.5n + 5

   d. What is the cost of the 8 topping pizza on the first Thursday of February?

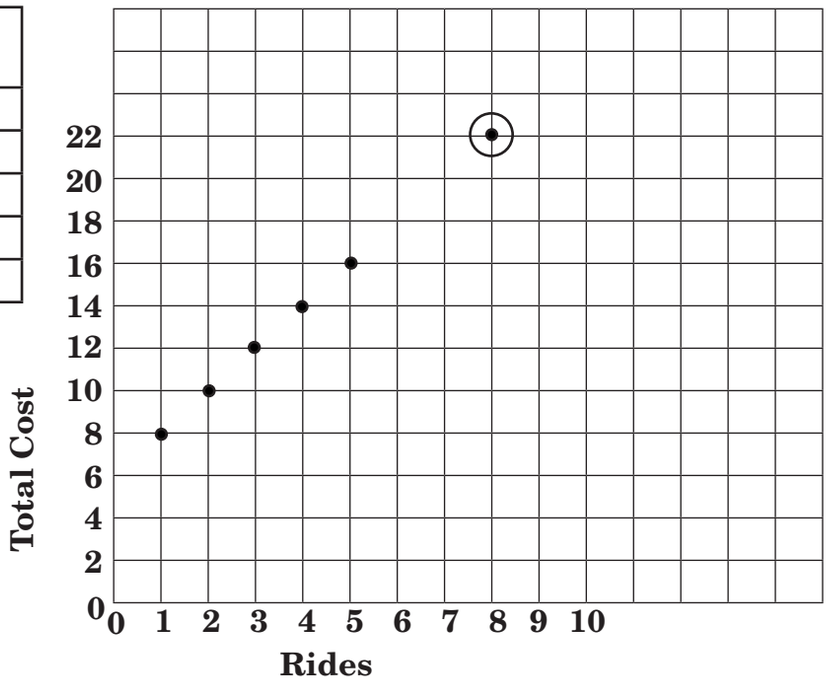
      Cost = 0.5(8) + 5 = $9

4. Admission to Wacky World is $6. Each ride is an additional $2.

   a. What is the pattern rule showing how total cost is related to the number of rides?
   Cost (c) = 2r + 6

   b. Complete a table of values for this relation, and graph the relation.

Rides (r)	Total Cost (c)
1	**8**
2	**10**
3	**12**
4	**14**
5	**16**



   c. Circle the point on the graph that would show the total cost of going on 8 rides.

   d. If Charles goes into the park with $35, what is the maximum number of rides he can go on?

   14 rides and $1.00 leftover.
   35 - 6 = 29
   $\frac{29}{2} = 14.5$

Printed on 10%
Post-Consumer
Recycled Paper

Please Recycle