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This Practice Workbook is yours! Use it to see what you know and think about what you might need to work on.

Getting Started

Everything you learn builds on something you have experienced or learned before.

Take Your Time

- Don't rush. Not all math tasks take the same amount of time to complete.

What Might This Look Like?

- Use tools and materials to help you complete the tasks.
- Try “seeing the problem in your mind” to help you reason your way to a solution.

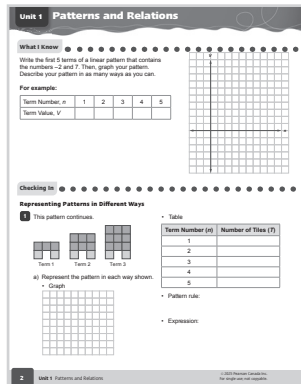
Try Your Best!

- Read over the tasks and think about questions you might have that would help you better understand them.
- Reflect on what you already know and use this information to help you complete the tasks.

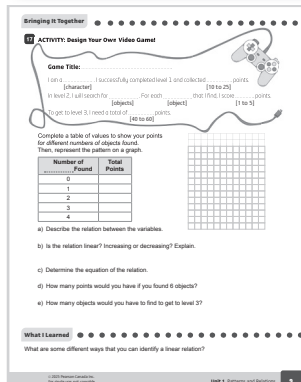
Reflect On and Share Your Learning

- Share your thinking and findings—talk about strategies with your friends and family.
- Look back in the Practice Workbook to get ideas to help you solve new problems!

How Is the Practice Workbook Organized?

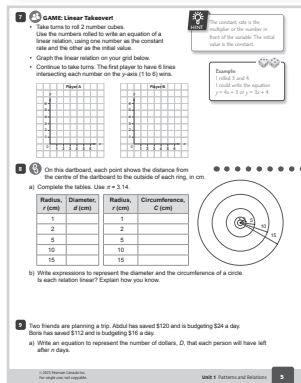


What I Know — Review the things you already know.



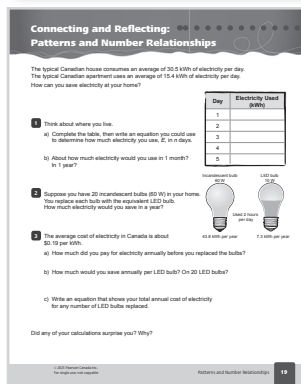
Checking In — Build on your understanding and make connections to the world around you. Use the space provided to clearly record your thinking so others can understand you.

Bringing It Together — Work with others to discuss your thinking and strategies and show them what you know.



What I Learned — Answer the question by reflecting on what you know about important math learning.

Connections question — Think of how working on this math task relates to other things you know.



Connecting and Reflecting — Use what you have learned to complete the task and to help you make sense of the world around you.

Patterns and Number Relationships



About how much electricity does your home use each year?
What would you need to know to be able to answer this question?

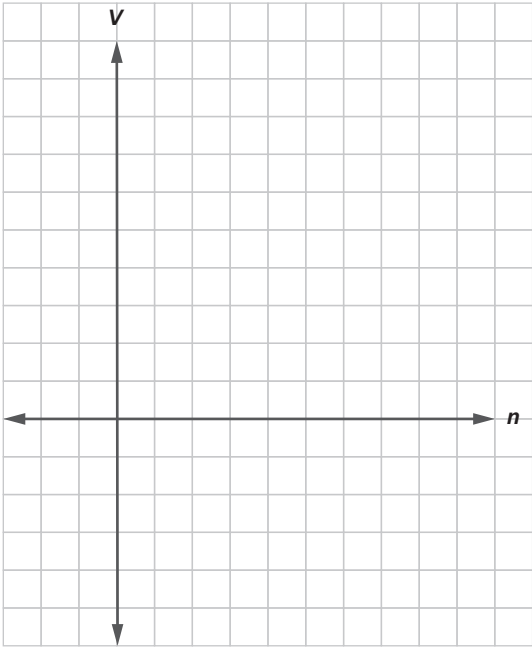
Unit 1 Patterns and Relations

What I Know

Write the first 5 terms of a linear pattern that contains the numbers -2 and 7 . Then, graph your pattern. Describe your pattern in as many ways as you can.

For example:

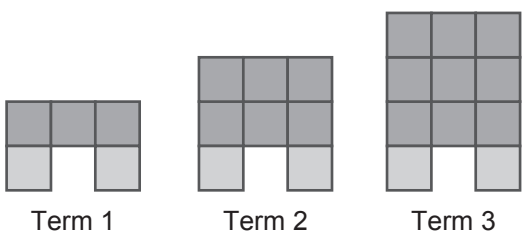
Term Number, n	1	2	3	4	5
Term Value, V					



Checking In

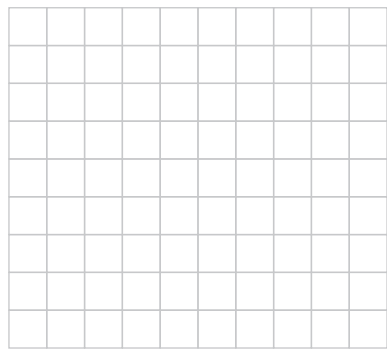
Representing Patterns in Different Ways

1 This pattern continues.



a) Represent the pattern in each way shown.

• Graph



• Table

Term Number (n)	Number of Tiles (T)
1	
2	
3	
4	
5	

• Pattern rule:

• Expression:

b) How many tiles will be in Term 30?
Show how you know.

c) Will there ever be exactly 100 tiles
in this pattern? Explain.

d) What would Term 0 look like? How do you know?

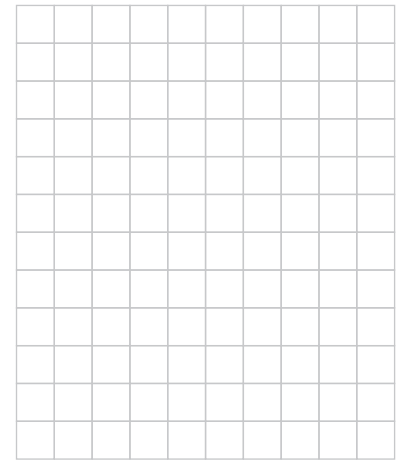
2 Yousef is planning an Escape Room party. It costs \$50 to rent the room,
plus \$20 per person.

a) Write an expression to represent the total cost.

b) Write an equation to represent the relation between
the total cost and the number of people.

c) Use the equation to complete the table of values.

Number of People, n	Cost, C (\$)
0	
1	
2	
3	
4	



d) Graph the relation. Did you join the points? Why or why not?

e) Describe the relationship between the variables.
What does the intercept on the vertical axis represent?

f) If Yousef invited 7 people to the party, how much would it cost?

g) Yousef has a budget of \$250. What is the greatest number of people they can invite?

3 Determine the missing coordinates and values in these linear patterns.

a) (0, 0), (1, 8), (2, 16), (3,),

b) (0, 12), (1, 8), (....., 4), (3, 0), (4,),

c)

x	1	2	3	4	5
y	7	12			27

d)

x	-2	-1	0	1	2
y			6	10	14

4 Here is the equation of a linear relation: $y = -2x + 5$.

a) Determine the missing coordinate in each ordered pair.

• $(-3, \dots)$

• $(\dots, -3)$

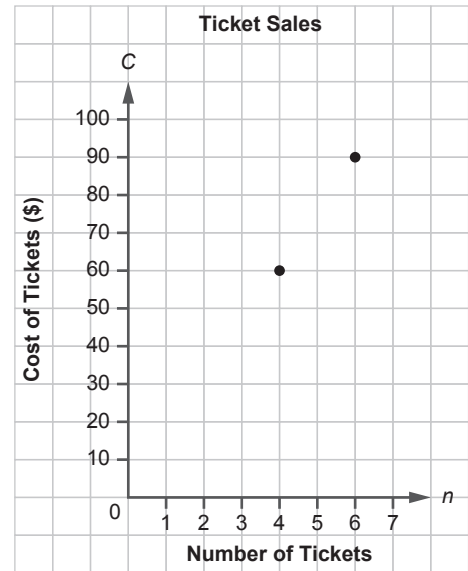
b) Does the ordered pair $(-12, -19)$ belong to the relation? Explain.

5 This graph represents the ticket sales for a fundraiser.

a) How much are 2 tickets? 10 tickets?

Assume all tickets are the same price.

b) The cost of tickets was \$345. How many tickets were sold?



6 Match each linear equation to its corresponding table of values or graph. For the equation that does not have a match, draw its graph.

$y = 3x - 2$

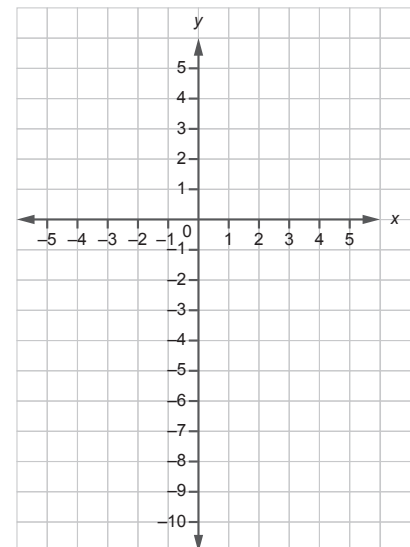
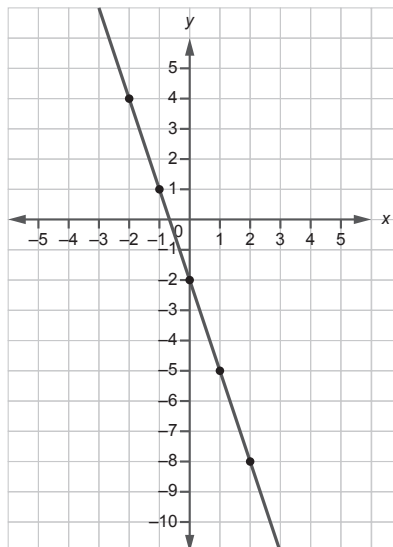
$y = -3x$

$y = -3x - 2$

$y = -3x + 2$

x	y
-2	6
-1	3
0	0
1	-3
2	-6

x	y
-2	8
-1	5
0	2
1	-1
2	-4

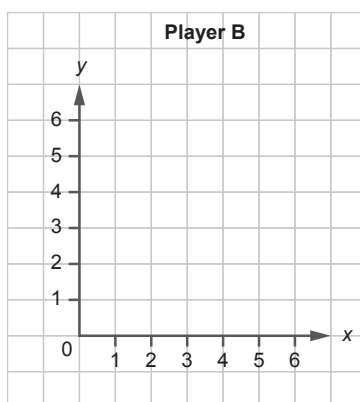
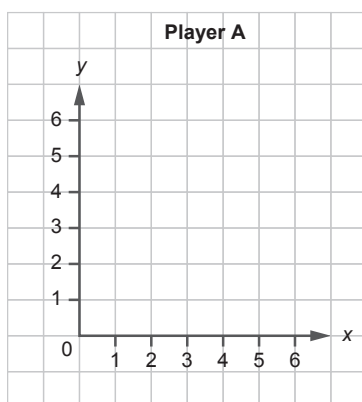


7



GAME: Linear Takeover!

- Take turns to roll 2 number cubes. Use the numbers rolled to write an equation of a linear relation, using one number as the constant rate and the other as the initial value.
- Graph the linear relation on your grid below.
- Continue to take turns. The first player to have 6 lines intersecting each number on the y -axis (1 to 6) wins.



The constant rate is the multiplier or the number in front of the variable. The initial value is the constant.



Example:

I rolled 3 and 4.

I could write the equation $y = 4x + 3$ or $y = 3x + 4$.

8

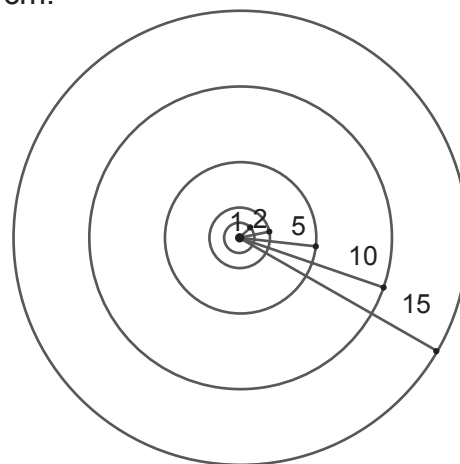


On this dartboard, each point shows the distance from the centre of the dartboard to the outside of each ring, in cm.

- a) Complete the tables. Use $\pi = 3.14$.

Radius, r (cm)	Diameter, d (cm)
1	
2	
5	
10	
15	

Radius, r (cm)	Circumference, C (cm)
1	
2	
5	
10	
15	



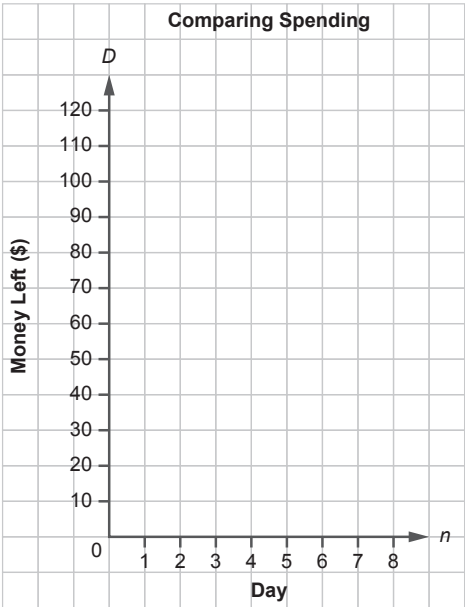
- b) Write expressions to represent the diameter and the circumference of a circle. Is each relation linear? Explain how you know.

9

Two friends are planning a trip. Abdul has saved \$120 and is budgeting \$24 a day. Boris has saved \$112 and is budgeting \$16 a day.

- a) Write an equation to represent the number of dollars, D , that each person will have left after n days.

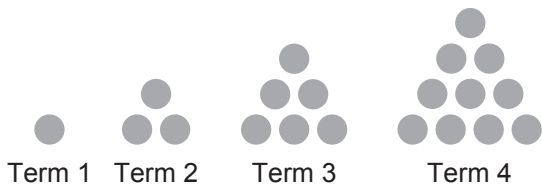
b) Graph their planned spending. Use a different colour or symbol for each person.
Describe the relationships on the graph.



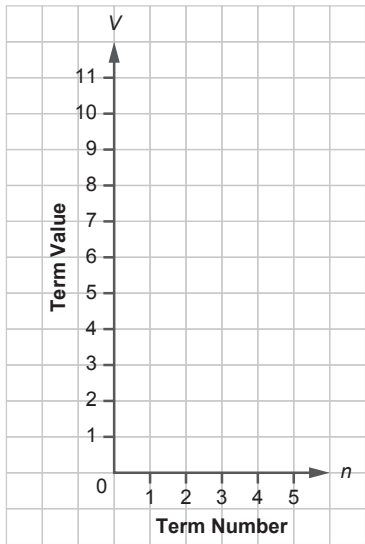
- c) Use the graph to answer these questions.
- When will both friends have the same amount of money left?
 - Who will run out of money first?

10 This pattern continues.

a) Represent the pattern as a table of values and on a graph.



Term Number, n	Term Value, V
1	
2	
3	
4	



b) Is the relation linear or non-linear? How do you know?

11 a) For each table of values, is the relation linear or non-linear? Explain how you know.

Table A	
x	y
1	9
2	13
3	17
4	21

Table B	
x	y
1	9
2	10
4	12
8	20

Table C	
x	y
1	9.5
3	12.5
5	17.5
10	25.0

- b) For one of the non-linear patterns, explain the changes you could make so it is linear.

- 12** a) Graph these linear equations on the same grid for x -values from 0 to 3.

$$y = 1.5x + 2$$

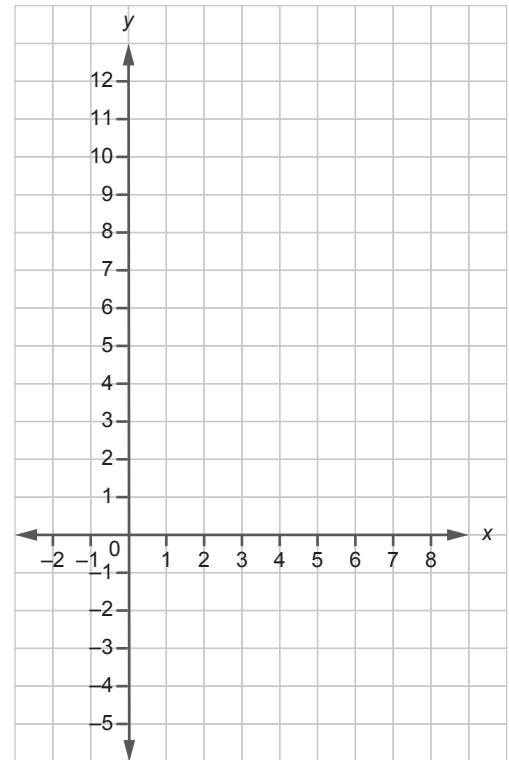
$$y = -2x + 2$$

$$y = 1.5x - 1$$

$$y = 3x + 2$$

Did you join the points? Explain.

- b) Choose a pair of graphs.
How are they alike? How are they different?
Repeat with another pair of graphs.

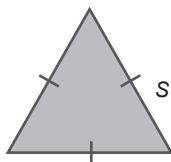


- c) Choose one graph. What could it represent?

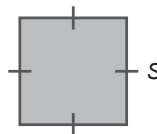
Evaluating Expressions

- 13** Determine the perimeter of each shape.

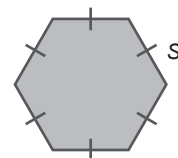
a) $s = 3.2$ mm



b) $s = 4.17$ cm



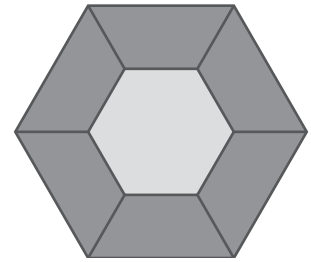
c) $s = 6.86$ m



- 14** Jamal is using this tile design to redecorate their bathroom. The cost of one tile design can be calculated using the expression $h + 6t$, where h represents the price of one hexagon and t represents the price of one trapezoid.

- a) Calculate the cost when $h = \$1.75$ and $t = \$1.25$.
- b) One hundred of the large tile designs are needed. What is the total cost?

Large Tile Design



15 **GAME: Rolling Expressions!**

Each of you use your own game board. You will need a number cube labelled from 1–6.

- Fill in the blanks with each of the numbers from 1 to 10 to complete the expressions.
- Roll a number cube. Use the number rolled as the value of n in one of your five expressions. Record the number rolled. Then, evaluate your expression. The value of your expression is your score for that round.
- Repeat four more times until all expressions have been used.
- Calculate your total score. The player with the greater score wins.



Think about where you place each of the numbers. For example, will you put the larger numbers with the variables or without?

Expression	Number Rolled	Value of Expression (Score)
..... n +		
..... n -		
..... - n		
- - n		
..... + n		
Total Score		

- 16** Match each expression with its value when $m = 4.2$ and $n = 14.5$.



Bringing It Together

17 ACTIVITY: Design Your Own Video Game!

Game Title:

I am a I successfully completed level 1 and collected points.
[character] [10 to 25]

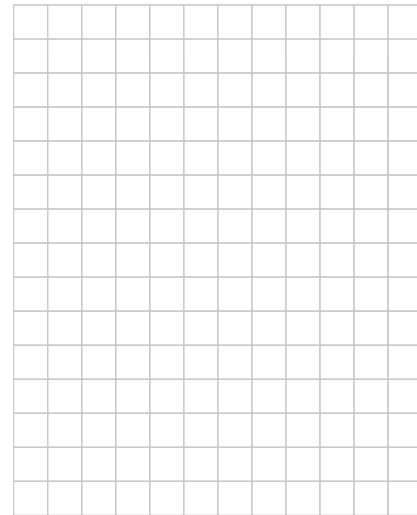
In level 2, I will search for For each that I find, I score points.
[objects] [object] [1 to 5]

To get to level 3, I need a total of points.
[40 to 60]



Complete a table of values to show your points for different numbers of objects found. Then, represent the pattern on a graph.

Number of Found	Total Points
0	
1	
2	
3	
4	



- Describe the relation between the variables.
- Is the relation linear? Increasing or decreasing? Explain.
- Determine the equation of the relation.
- How many points would you have if you found 6 objects?
- How many objects would you have to find to get to level 3?

What I Learned

What are some different ways that you can identify a linear relation?