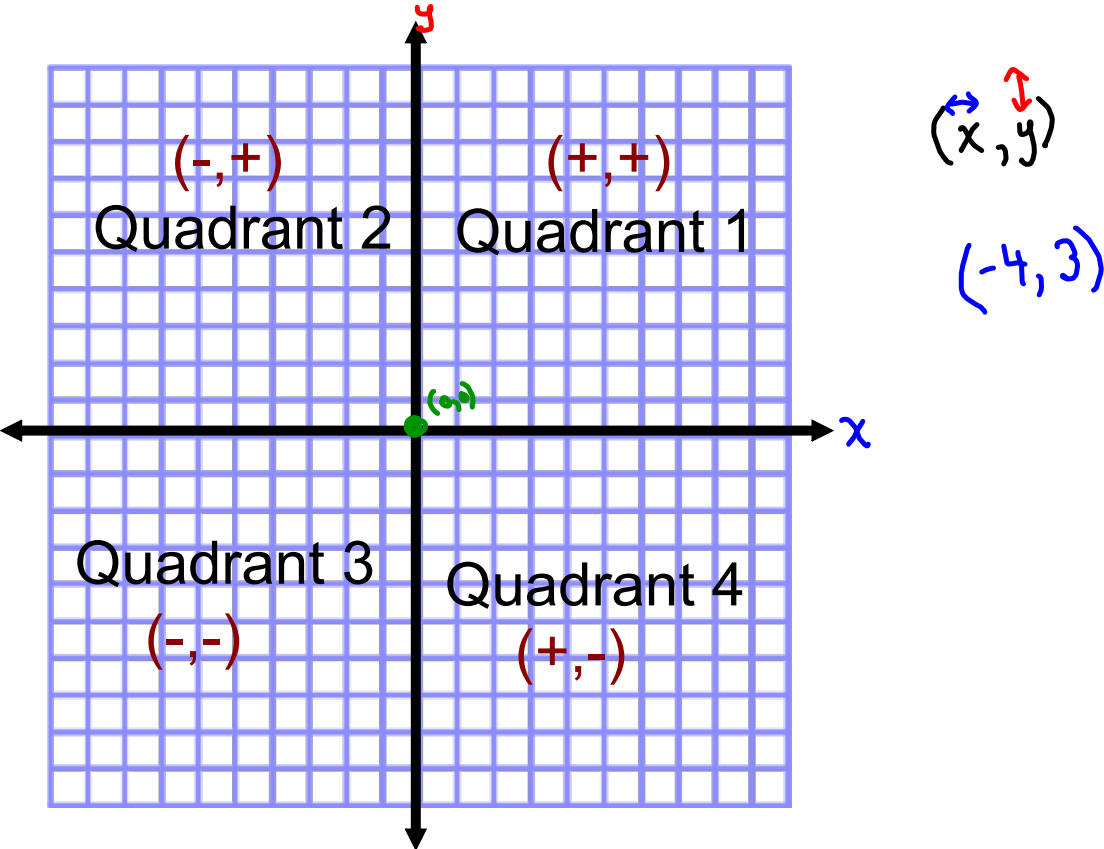


Curriculum Outcomes:

(PR1) Generalize a pattern arising from a problem-solving context using linear equations and verify by substitution.

(PR2) Graph linear relations, analyze the graph and interpolate or extrapolate to solve problems.

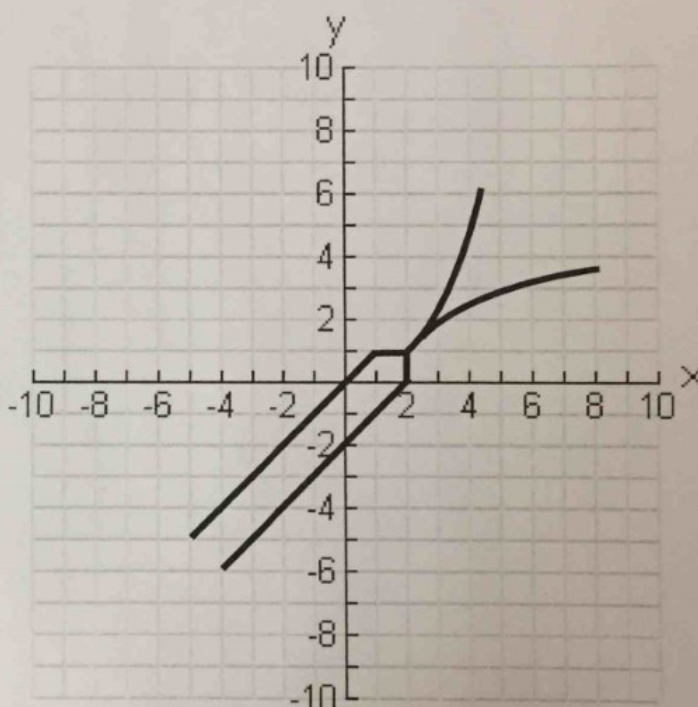
Student Friendly: Being able to identify a linear pattern in a t-table.



Coordinate Graphing Pictures

Plot the points and connect the dots in order.

- | | |
|----------|----------|
| (2, 0) | |
| (3, 1) | |
| (5, 2) | |
| (7, 2) | (-7, -6) |
| (8, 1) | (-8, -5) |
| (8, -1) | (-8, -3) |
| (6, -3) | (-7, -2) |
| (4, -4) | (-4, -1) |
| (2, -4) | (-2, -1) |
| (0, -3) | (-3, 1) |
| (0, -5) | (-3, 3) |
| (-1, -8) | (-2, 5) |
| (-2, -9) | (0, 7) |
| (-4, -9) | (2, 7) |
| (-5, -8) | (3, 6) |
| (-4, -6) | (3, 4) |
| (-5, -6) | (2, 2) |
| (-5, -5) | (1, 1) |



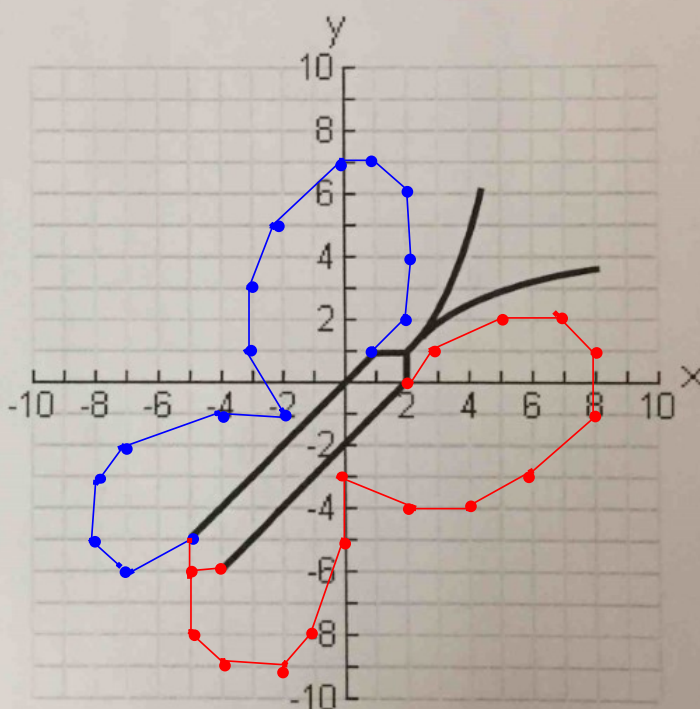
Math Out Loud

A quick, fun and engaging way of evaluating a student's mastery of graphing! These little exercises can be used as warm-ups, bonus questions, or brain breaks.

Coordinate Graphing Pictures

Plot the points and connect the dots in order.

- | | |
|----------|----------|
| (2, 0) | |
| (3, 1) | |
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| (7, 2) | (-7, -6) |
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| (8, -1) | (-8, -3) |
| (6, -3) | (-7, -2) |
| (4, -4) | (-4, -1) |
| (2, -4) | (-2, -1) |
| (0, -3) | (-3, 1) |
| (0, -5) | (-3, 3) |
| (-1, -8) | (-2, 5) |
| (-2, -9) | (0, 7) |
| (-4, -9) | (2, 7) |
| (-5, -8) | (3, 6) |
| (-4, -6) | (3, 4) |
| (-5, -6) | (2, 2) |
| (-5, -5) | (1, 1) |



Math Out Loud

A quick, fun and engaging way of evaluating a student's mastery of graphing! These little exercises can be used as warm-ups, bonus questions, or brain breaks.

Section 4.1

Writing Equations to Describe Patterns

Let's look at it again.

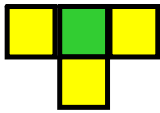


Figure 1

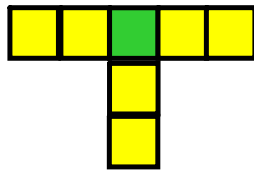


Figure 2

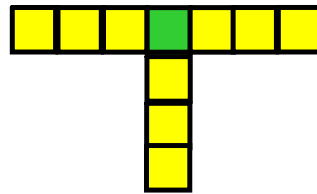


Figure 3

THUS

f Figure #	n # of Blocks
1	4
2	7
3	10
4	13
5	16

Write an equation that relates the number of blocks, n , to the figure number, f .

$$N = 3f + 1 \text{ head}$$



(Common difference) x Figure + #

Is there a pattern?



f Figure #	c # Circles
1×2 <hr/> <u>1</u>	<u>1</u>
+1 2×2 <hr/> <u>2</u>	<u>3</u>
+1 3×2 <hr/> <u>3</u>	<u>5</u>
+1 <u>4</u>	<u>7</u>
+1 <u>5</u>	<u>9</u>
<u>6</u>	<u>11</u>

Write an equation that relates the number of circles, c , to the figure number, f .

$$c = 2f - 1$$



T- Tables

or

Input/Output tables

x	y
1	3
2	8
3	13
4	18
5	23
...	
...	
50	248

Handwritten notes on the table:
 - Purple arrows between x=1 and x=2, and x=2 and x=3, labeled "+1".
 - Purple arrows between y=3 and y=8, and y=8 and y=13, labeled "+5".
 - A purple "x5" is written next to x=1.
 - A red arrow points from the table to the equation y = 5x - 2.

Write an equations

$y = \#x \pm \#$ *head*

$y = \frac{5x}{1} - 2$

Write an expression for the relationship

$5x - 2$

$y = 5x - 2$

$y = 5(50) - 2$

$y = 250 - 2$

$y = 248$

T- Tables

or

Input/Output tables

$$y = \textcircled{H}x \pm \textcircled{H}$$

↓
Chart
↓
head

Write an equations

$$y = \underline{-4}x + 1$$

Write an expression for the relationship

$$-4x + 1$$

x	y
1	-3
2	-7
3	-11
4	-15
5	-19
6	-23
...	
...	
...	
100	-399

Handwritten notes: Purple arrows show a change of +1 in x and -4 in y between consecutive rows.

$$y = -4x + 1$$

$$y = -4(100) + 1$$

$$y = -400 + 1$$

$$y = -399$$

Equation

$$y = \left(\frac{\text{Change } y}{\text{Change } x} \right) ("x") \pm \#$$

Chart

head

#

$$y = \frac{\Delta y}{\Delta x} x \pm \#$$

Remember:

Δ "means change in"

$x \rightarrow$ independent

$y \rightarrow$ dependent

Try these

For $n = 2$, solve for each of the following

1) $P = 5n + 6$

$$P = 5(2) + 6$$

$$p = 10 + 6$$

$$p = 16$$

2) $K = 4n - 1$



3) $W = 10n - 5$



For $n = -5$, solve for each of the following

1) $P = 5n + 6$



2) $K = 4n - 1$



3) $W = 10n - 5$



Try these

For $n = 2$, solve for each of the following

1) $P = 5n + 6$

$$P = 5(2) + 6$$

$$p = 10 + 6$$

$$p = 16$$

2) $K = 4n - 1$

$$K = 4(2) - 1$$

$$k = 8 - 1$$

$$k = 7$$

3) $W = 10n - 5$

$$W = 10(2) - 5$$

$$W = 20 - 5$$

$$W = 15$$

For $n = -5$, solve for each of the following

1) $P = 5n + 6$

$$P = 5(-5) + 6$$

$$P = -25 + 6$$

$$p = -19$$

2) $K = 4n - 1$

$$K = 4(-5) - 1$$

$$K = -20 - 1$$

$$K = -21$$

3) $W = 10n - 5$

$$W = 10(-5) - 5$$

$$w = -50 - 5$$

$$W = -55$$



A large water tower holds 15000 liters of water, however during the winter the water tower was damaged and started to leak. This table shows the amount of water every hour after it sprung the leak. The level of water changes at a constant rate.

Time (t hours)	Amount (A Liters)
0	15 000
1	14 800
2	14 600
3	14 400
4	14 200

$$y = \frac{\Delta y}{\Delta x} x \pm \#$$

i) Write an equation that relates the amount of water to the time since it started leaking.

$$y = \frac{\Delta y}{\Delta x} x \pm \#$$

ii) Write an expression for the amount in terms of the time since the water tower began to leak.

iii) How much water in the water tower after 10 hours?

iv) When will the water tower be empty?



A large water tower holds 15000 liters of water, however during the winter the water tower was damaged and started to leak. This table shows the amount of water every hour after it sprung the leak. The level of water changes at a constant rate.

$x = t$	$y = A$	
Time (t hours)	Amount (A Liters)	
0	15 000	
1	14 800	-200
2	14 600	-200
3	14 400	-200
4	14 200	-200

$$y = \frac{\Delta y}{\Delta x} x + \#$$

$$y = \frac{-200}{1} x + 15000$$

i) Write an equation that relates the amount of water to the time since it started leaking.

$$y = \frac{\Delta y}{\Delta x} x + \#$$

$$y = -200x + 15000$$

$$A = -200t + 15000$$

ii) Write an expression for the amount in terms of the time since the water tower began to leak.

$$-200t + 15000$$

iii) How much water in the water tower after 10 hours?

$$\begin{aligned} A &= -200t + 15000 \\ &= -200(10) + 15000 \\ &= -2000 + 15000 \\ &= 13000 \end{aligned}$$

iv) When will the water tower be empty?

$$A = -200t + 15000$$

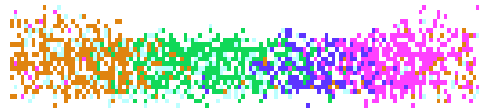
$$0 = -200t + 15000$$

$$-15000 = -200(t)$$

$$\frac{-15000}{-200} = \frac{-200(t)}{-200}$$

$$75 = t$$

Class/Homework



-click on the "Homework" link on my teachers page for optional review questions

- If you have any questions you can contact me on the

Remind app

or

through email:

melanie.burns@nbed.nb.ca



Class/Homework

Page 159-161

Questions

4,5,6,7,8,9,11, 12, 14, 15, 16,