### Mrs. McCauley

**Packet Work** 

The unit we are studying addresses graphing in the coordinate plane. Khan Academy is a great resource if you need extra help. You can watch videos on every topic, complete practice problems, and even take practice tests. You can find this by searching Khan Academy or use the links below:

https://www.khanacademy.org/math/basic-geo/basic-geo-coord-plane https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:linear-equations-graphs

#### Day 6

- 1. Study the notes for The Coordinate System.
- 2. Complete 4 practice worksheets for graphing in the coordinate plane.
- 3. Take the Graphing Points Quiz.

#### Day 7

- 1. Study the notes for Graphing Linear Equations.
- 2. Complete the 3 practice worksheets labeled for Day 7. You must complete the tables and graph the equations to receive full credit. If your graphs are not straight lines, then you have some points wrong.

### Day 8

1. Complete the "From Tables to Graphs and Back! Match" Activity. Match each graph with the correct equation and table. Record your answers on the table provided.

### Day 9

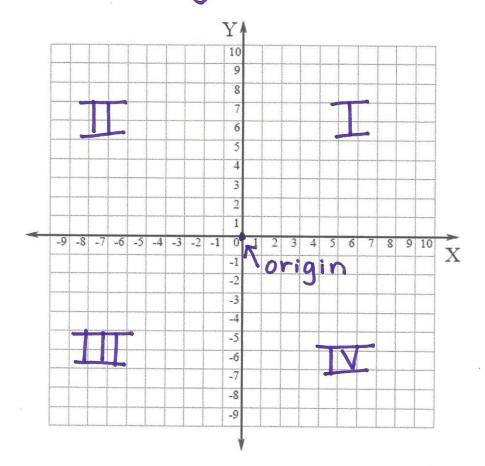
1. Complete the "Equations, Tables, and Graphs Pizza Shop" lesson. Answer every question and use the graph paper to create your graphs.

### **Day 10**

- 1. Study the example linear equation story problem (Caricatures at the Fair).
- 2. Complete the 4 story problems for linear equations (T-Shirt Shop, Towing Service, Rental Car, and Plumber) labeled Day 10. Answer every question to receive full credit.

### **The Coordinate System**

- A coordinate system, or coordinate plane, is used to locate points in a 2-dimensional plane.
- The horizontal number line is the X-axis
- The vertical number line is the Y-axis.
- Their intersection is the <u>Origin</u>. (Label)



- The coordinate plane contains four quadrants (I, II, III, IV). Label the quadrants.

(x, y)

- The first number in an ordered pair is the x-coordinate.
- The second number is the y-coordinate.

Example: (3,2) 3 is the x-coordinate, 2 is the y-coordinate.

• A point is defined on the coordinate plane by one, AND ONLY ONE, ordered pair.

Tell what point is located at each ordered pair.

- 1. (3,-2) B 2. (2,3) \_\_\_ 3. (-5,5) \_\_\_
- 4. (-7, -8) <u>H</u> 5. (-4, 4) \_\_\_ 6. (-5, 0) \_\_\_

Write the ordered pair for each given point.

- 9. P \_\_\_\_\_

Plot the following points on the coordinate grid.

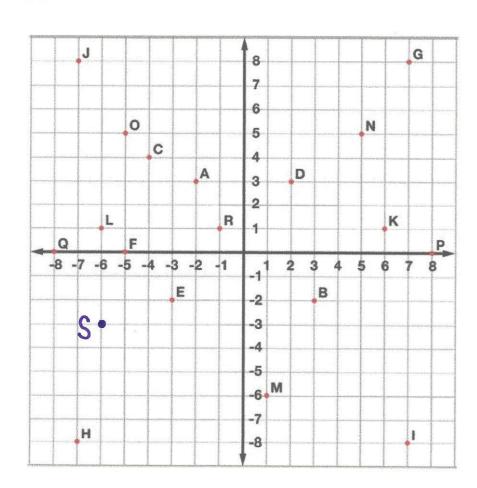
Identify the quadrant containing each point.

17. J

18. I

19. D

20. E



| NAME | DATE | PERIOD |  |
|------|------|--------|--|

### **Study Guide and Intervention**

### The Coordinate Plane

The **coordinate plane** is used to locate points. The horizontal number line is the **x-axis**. The vertical number line is the **y-axis**. Their intersection is the **origin**.

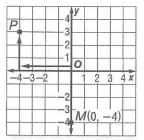
Points are located using **ordered pairs**. The first number in an ordered pair is the **x-coordinate**; the second number is the **y-coordinate**.

The coordinate plane is separated into four sections called quadrants.

### EXAMPLE 1

Name the ordered pair for point P. Then identify the quadrant in which P lies.

- Start at the origin.
- Move 4 units left along the *x*-axis.
- Move 3 units up on the y-axis.
  The ordered pair for point P is (-4, 3).
  P is in the upper left quadrant or quadrant II.



### **EXAMPLE 2** Graph and label the point M(0, -4).

- Start at the origin.
- Move 0 units along the *x*-axis.
- Move 4 units down on the y-axis.
- Draw a dot and label it M(0, -4).

#### EXERCISES

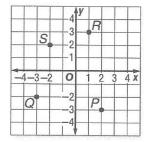
Name the ordered pair for each point graphed at the right. Then identify the quadrant in which each point lies.

1. P

2. Q

3. R

4. S



Graph and label each point on the coordinate plane.

5. A(-1, 1)

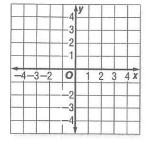
**6.** B(0, -3)

**7.** *C*(3, 2)

8. D(-3, -1)

**9.** E(1, -2)

**10.** F(1, 3)



### **Practice: Skills**

### The Coordinate Plane

Name the ordered pair for each point graphed at the right. Then identify the quadrant in which each point lies.



2. B

4. D





7. G

8. H

9. I

10. J

Graph and label each point on the coordinate plane.

11. 
$$N(-1, 3)$$

**12.** V(2, -4)

14. P(-6, 2)

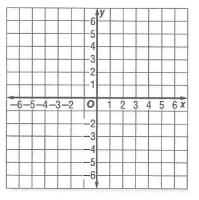
15. 
$$M(-5, 0)$$

**16.** K(-1, 5)

17. 
$$I(-3, -3)$$

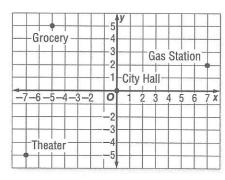
**18.** A(5, -3)

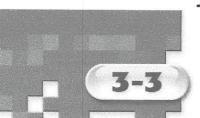




Name the ordered pair for each point on the city map at the right.

- 20. City Hall
- 21. Theater
- 22. Gas Station
- 23. Grocery





Day 6

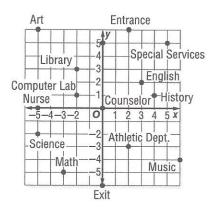
NAME \_\_\_\_\_D

\_ DATE \_\_\_\_\_ PERIOD \_\_\_\_

## **Practice: Word Problems**

### The Coordinate Plane

SCHOOL For Exercises 1–4, use the coordinate plane at the right. It shows a map of the rooms in a junior high school.



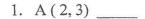
- 1. Thalia is in the room located at (-2, 1). What room is she in? Describe in words how to get from the origin to this point.
- 2. Thalia's next class is 8 units to the right and 5 units down on the map from where she is now. In what room is Thalia's next class? Find the ordered pair that represents the location of that room.
- 3. Tyrone is in the Art room, but his next class is in the History room. Give Tyrone directions on how to get to the History room.
- **4.** On the map, which classrooms are located in the third quadrant? Describe the coordinates of all points in the third quadrant.

- 5. NEIGHBORHOOD Delsin made a map of his neighborhood in such a way that each intersection is a point on a coordinate plane. Right now, Delsin stands at point (-4, -3). Give the ordered pair of where he will be if moves 5 units to the right and 7 units up on the map.
- **6. NEIGHBORHOOD** Refer to Exercise 5. In which quadrant is Delsin when he is done walking? Describe this quadrant.

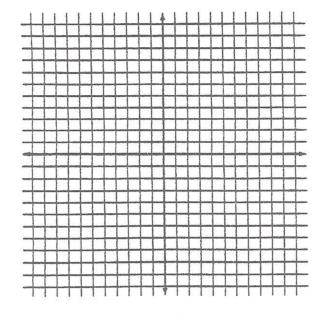
|       | 1. * | D .:          | 0    |
|-------|------|---------------|------|
| Crran | nıng | <b>Points</b> | Ouiz |
|       |      |               |      |

Name:

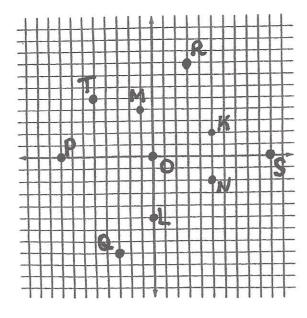
Graph the points on the coordinate plane, and name the quadrant for each point.



- 2. B (-5, -2)
- 3. C (-1, 0) \_\_\_\_
- 4. D (-4, 3) \_\_\_\_\_
- 5. E (2, -1) \_\_\_\_
- 6. F (0, -5)
- 7. G (4, 1) \_\_\_\_
- 8. H (-3, -3) \_\_\_\_\_
- 9. I (3,0) \_\_\_\_\_
- 10. J (-2, 3) \_\_\_\_\_



Name the coordinates for the points graphed on the coordinate plane to the left.



- 11. K \_\_\_\_\_
- 12. L \_\_\_\_\_
- 13. M \_\_\_\_\_
- 14. N \_\_\_\_\_
- 15. O \_\_\_\_\_
- 16. P \_\_\_\_\_
- 17. Q \_\_\_\_\_
- 18. R \_\_\_\_\_
- 19. S \_\_\_\_\_
- 20. T \_\_\_\_\_

### Graphing Linear Equations

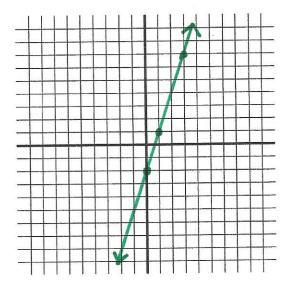
Method I: Make a table

- 1. <u>set up a table</u>
- 2. Choose values for x
- 3. substitute values for x and solve for y
- 4. graph the points from the table
- 5. connect the points to make a line

### **EXAMPLE:**

$$y = 3x - 2$$

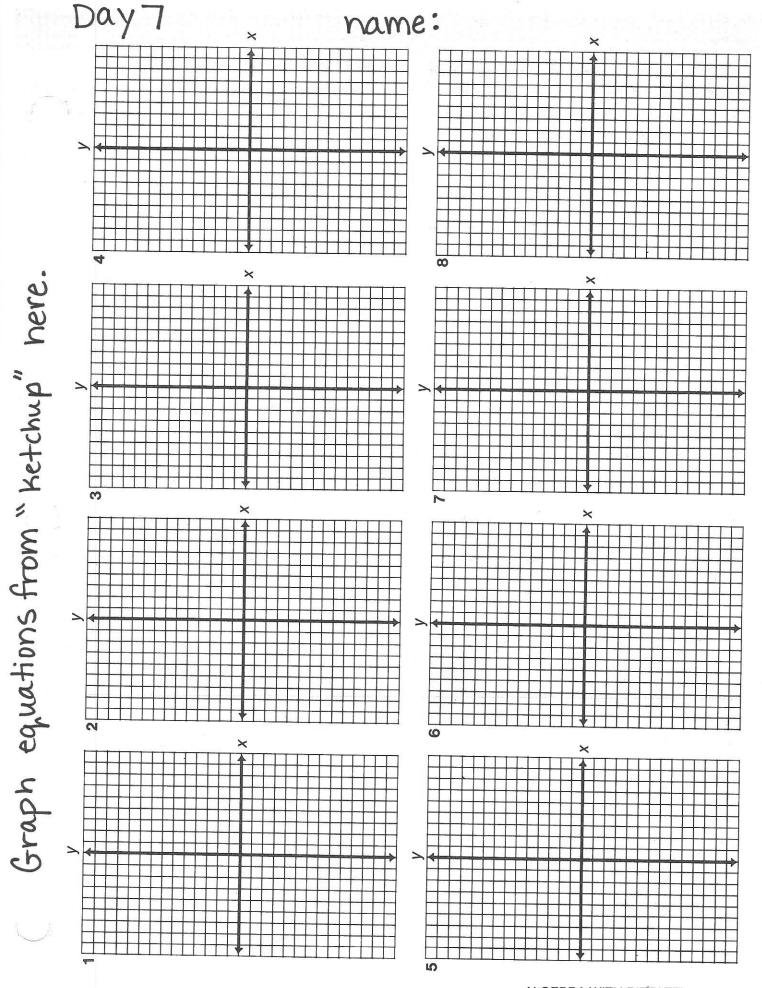
| X  | 3(x) - 2  | y   |
|----|-----------|-----|
| l  | 3(1) - 2  | 1   |
| 3  | 3(3)-2    | 7   |
| -4 | 3(-4) - 2 | -14 |
| 0  | 3(0) - 2  | -2  |



- \* use as many points as needed
  - \* pick any numbers you want for x
  - \* Sometimes the points will not fit on the graph like (-4,-14)

Complete the table for each equation. Find each answer in the code key and notice the letter next to it.

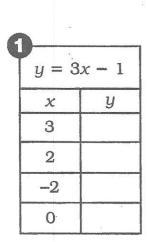
|  | DE KEY |                        | Œ      | A         | <br> -                                 | <u> </u> | N          | <b>X</b> | _   | Z                  | I  |          | В   | Ш       | 0          | S              | 11 32                            |
|--|--------|------------------------|--------|-----------|--|----------|------------|----------|-----|--------------------|----|----------|-----|---------|------------|----------------|----------------------------------|
| of the page that contains the circled number in that row of the table. | CODE 1 | $y = \frac{1}{2}x - 4$ | x y 10 | 10 (13) 7 | -2 (14) 6                              | 4 (15) 4 | -8<br>(16) | 2        | 0   | -<br> <br> -<br> - |    | <u> </u> |     | 8- (30) | 9 (31) -10 | 6 (32) —11     | 21 22 23 24 25 26 27 28 29 30 31 |
| le page that contains the circle                                       | т      | y = -3x + 1            | ×      | 6<br>E    | -3                                     | 4        | ) -2 (12)  |          |     |                    | iF | <b>X</b> | 0 , |         | 0 (27)     | \$<br>\$<br>\$ | 13 14 15 16 17 18 19 20 21       |
| Write this letter in the box at the bottom of the                      |        | y = 4 + 2x             | ×      | 3         | ) ———————————————————————————————————— | 1 (7)    | (8)<br>E-  |          | · · | V = 13x - 2        | 22 | ×        | † C | V       | 0          | 9 -2 (24)      |                                  |
| Write this letter in   |        | y = -2x                | ×      |           | 4                                      | -5       | ъ          |          | 2   | 9 + x - = A        | >  |          |     | - (     | 9          | 2)             | 1 2 3 4 5                        |

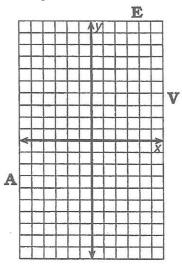


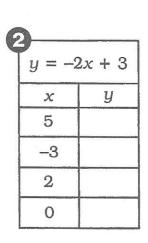
## Day 7 hame: What Helps Chicks Get Out of Their Shells?

Complete the table of solutions for each equation. Then graph the solutions and draw a line through them. The line, if extended, will cross a letter outside the grid. Write this letter in each box containing the exercise number.

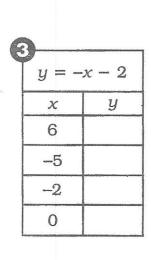
|  | 2 | " |
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|--|---|---|

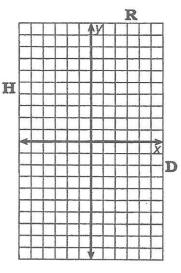




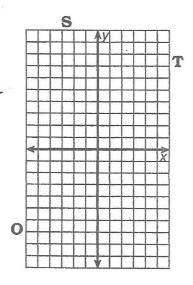


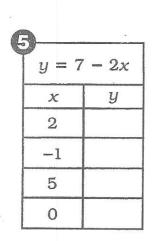
|   |   |   | I |   |   |   |   |   |          |   |   |   |   |
|---|---|---|---|---|---|---|---|---|----------|---|---|---|---|
|   |   |   |   |   |   | 4 | Y |   |          |   |   |   |   |
|   |   |   |   |   |   |   |   |   |          |   |   |   |   |
|   | _ |   | _ | H |   | _ |   | - | H        | _ | _ |   |   |
|   |   |   |   |   |   |   |   |   |          |   |   |   |   |
| U | - | _ | H | H | Н | Н | H | - | -        | - | - | - |   |
| _ |   |   |   |   |   |   |   |   |          |   |   |   |   |
|   | * |   |   |   |   |   |   |   |          |   |   | X |   |
|   | H | _ | - | H | H | Н | H | H | $\vdash$ | - | - | H | C |
|   |   |   |   |   |   |   |   |   |          |   |   |   |   |
|   | H | - | H | H | H |   | H | H | -        | H | - |   |   |
|   |   |   |   |   |   |   |   |   | F        | L |   |   |   |
|   |   |   |   |   |   |   |   |   |          |   |   |   |   |
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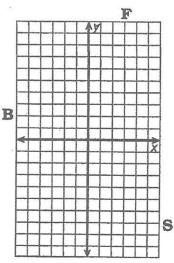




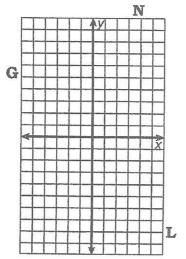
| 4             |   |     |
|---------------|---|-----|
|               | $y = \frac{1}{2}$                       | x+4 |
|               | х                                       | y   |
| on the second | 4                                       |     |
|               | 6                                       |     |
|               | -2                                      |     |
|               | 0                                       |     |
| Longie        | 700000000000000000000000000000000000000 |     |







| 6 y = | $-\frac{2}{3}x + 1$ |
|-------|---------------------|
| х     | y                   |
| 6     |                     |
| -6    |                     |
| 3.    |                     |
| , 0   |                     |



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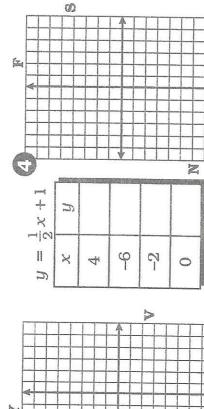
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| y = 3x | x                                  | 3                                | 2                                 | -2                                 | 0                        |  |
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|        | 7.                                 | 00 3                             | - i - c                           | the s                              | Ap.                      | The same of the sa |
| 0      | 0                                  | the                              | : ≥                               | ng t                               | (A)<br>(A)<br>(B)<br>(C) | Charles (action)   |
| 766    | tab                                | Hap t                            | ter.                              | aini                               | 69                       | 1  |
|        | 200                                | Grä                              | 10 m                              | ont                                | 60                       | 7  |
|        | 2                                  | J. J.                            | so a letter. Write this letter in | XC                                 | dens                     | -  |



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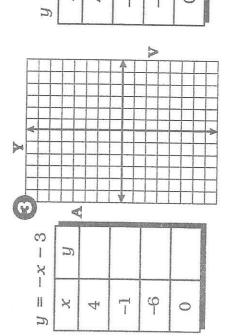
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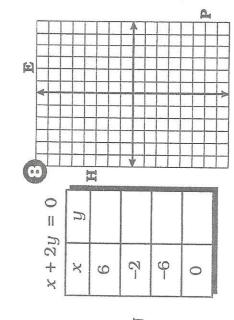
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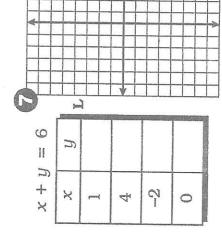
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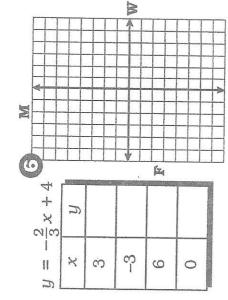
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PUNCHLINE • Algebra • Book A ©2006 Marcy Mathworks

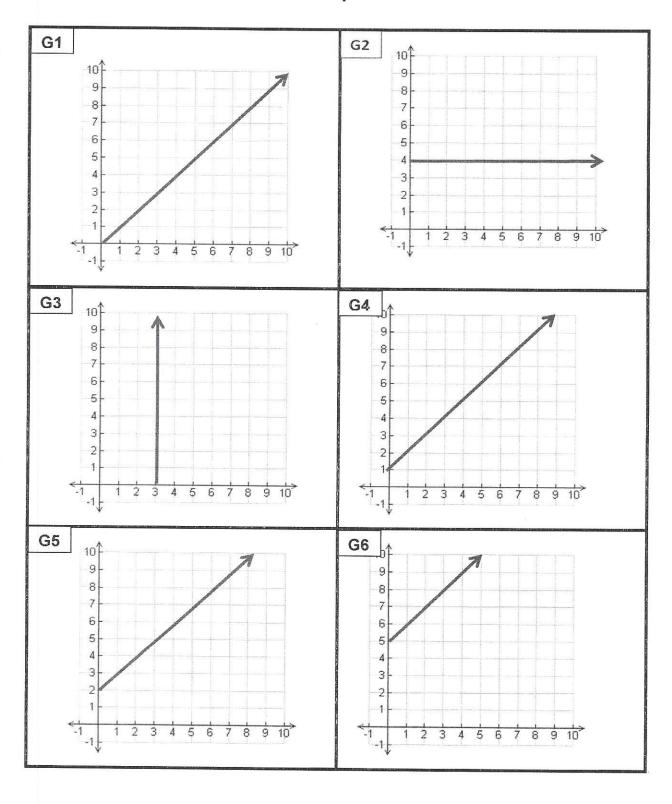
Linear Equations and Their Graphs: Tables and Graphs for Linear Equations

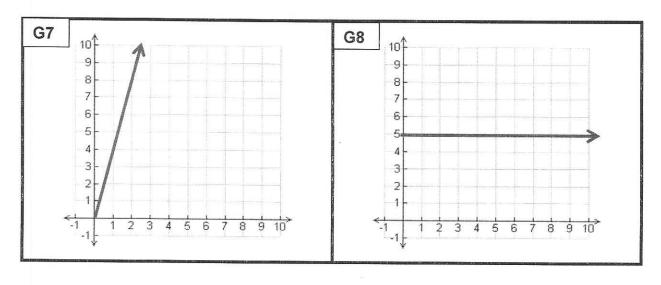
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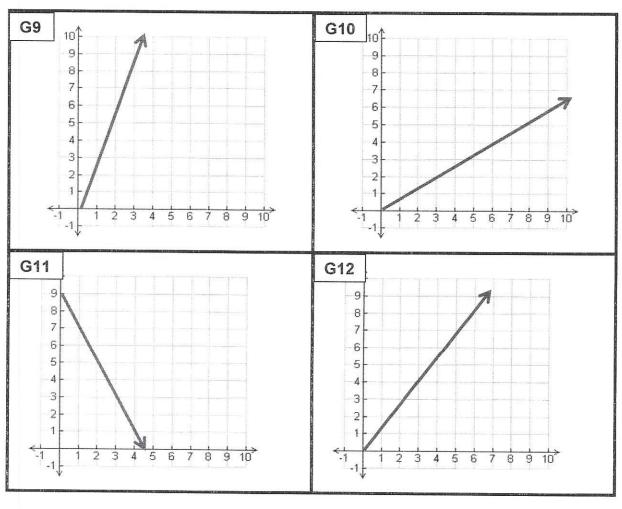
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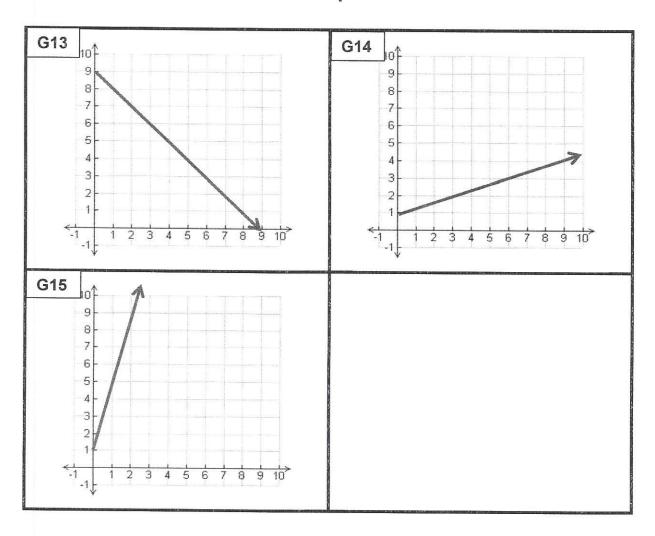
Lesson Objective: Working in pairs, match the graph cards to the corresponding equation card, table card and description card. Use the table to record your matches in addition to lining the cards up on your workspace for quick observation and feedback.

| From Tables | to Graphs and Back! | Match Activity |
|-------------|---------------------|----------------|
| Graph       | Equation            | Table          |
| G1          |                     |                |
| G2          |                     |                |
| G3          |                     |                |
| G4          |                     |                |
| G5          |                     |                |
| G6          |                     |                |
| G7          |                     |                |
| G8          |                     |                |
| G9          |                     |                |
| G10         |                     |                |
| G11         |                     |                |
| G12         |                     |                |
| G13         |                     | ,              |
| G14         |                     |                |
| G15         |                     |                |









| y = x + 5          | y=4x                   |
|--------------------|------------------------|
| x - 3 = 0          | y-5=0                  |
| y - 1 = x          | y = 3x                 |
| y=4                | y = x                  |
| $y = \frac{2}{3}x$ | y = x + 2              |
| y = -x + 9         | y = -2x + 9            |
| y = 4x + 1         | $y = \frac{1}{3}x + 1$ |
| $y = \frac{4}{3}x$ |                        |

| T1  |   |   | T2  |  |  | Т3  |   | T                      | 1.   | 77 |
|---|---|---|-----|--|--|-----|---|------------------------|--|----|
| A Land                                    | Х | У | ×   | у                                      |  | х   | У |                        | х  | у  |
|   | 1 | 5 | 0   | 2                                      | The State of the S | 0   | 0 |                        | 3  | 2  |
| 1   | 3 | 5 | 3   | 5                                      | 10 m  | 2   | 6 |                        | 6  | 4  |
|   | 5 | 5 | 5   | 7                                      | description of the   | 3   | 9 |                        | 9  | 6  |
| T5  |   |   | T6  |  |  | T7  |   | TE                     | 3  |    |
|   | x | у | х   | У                                      |  | ×   | У |                        | ж  | У  |
|   | 1 | 4 | 3   | 0                                      | DESCRIPTION OF THE PERSON OF T | 0   | 0 | W. Car                 | 0  | 0  |
|   | 3 | 4 | 3   | 3                                      | TOWNS THE REAL PROPERTY.   | 2   | 2 |                        | 1  | 4  |
| D. C. | 7 | 4 | 3   | 9                                      | Security Committee   | 5   | 5 | TOTAL CONTRACT         | 2  | 8  |
| Т9  |   |   | T10 |  | The same of the sa | T11 |   | T1                     | 12   |    |
|   | x | У | х   | У                                      | of the second second   | ×   | У |                        | x  | у  |
| e grade                                   | 0 | 5 | 1   | 2                                      | THE PERSON NAMED IN COLUMN NAM | 0   | 9 | NAME OF TAXABLE PARTY. | 3  | 2  |
|   | 2 | 7 | 3   | 4                                      | CARCING CONTRACTOR   | 1   | 8 |                        | 6  | 3  |
|   | 4 | 9 | 7   | 8                                      | MINIMANIANIANIA  | 3   | 6 |                        | 9  | 4  |
| T13                                       | 3 |   | T14 | allowers with the same reason produced |  | T15 |   |                        | W. W. B. J. J. J. W. |    |
|   | х | У | X   | У                                      | Note TO TO THE PARTY OF THE PAR | x   | У |                        |  |    |
|   | 0 | 9 | 0   | 1                                      |  | 0   | 0 |                        |  |    |
|   | 2 | 5 | 1   | 5                                      | Series Same  | 3   | 4 |                        |  |    |
|   | 4 | 1 | 2   | 9                                      | PARTY COMPANY  | 6   | 8 |                        |  |    |

### name:



## EQUATIONS, TABLES, AND GRAPHS



Jack, Tyler and Kylie work at a pizza shop. The table below gives the amount of money each earns for the first 4 hours worked.

| Time Worked | Money Earned (in dollar |       | dollars) |
|-------------|-------------------------|-------|----------|
| (in hours)  | Jack                    | Tyler | Kylie    |
| 0           | 0                       | 0     | 0        |
| 1           | 6                       | 9     | 7        |
| 2           | 12                      | 18    | 14       |
| 3           | 18                      | 27    | 21       |
| 4           | 24                      | 36    | 28       |

- 1. Assuming that each person continues to earn money at this rate, find the amount of money that each will earn after working 7 hours.
- Graph time worked and earnings for all three employees in the same coordinate plane.

\*on graph paper \*.

- 3. Use the graphs to determine the earnings of each employee after  $6\frac{1}{2}$  hours.
- 4. Use the graphs to determine the amount of time each employee will need to work to earn \$90.
- 5. What is the hourly rate of each employee?
- 6. How does the hourly rate affect the graphs?

- 7. For each employee, write an equation that can be used to determine the earnings after a given number of hours.
- 8. Use the equations from #7 to calculate the earnings of each employee after  $6\frac{1}{2}$  hours.
- 9. How does each employee's hourly rate show up in his or her equation?

Mariah was recently hired at the pizza shop. She has created a table of her earnings.



| Earnings     |
|--------------|
| (in dollars) |
| 0            |
| 5.50         |
| 11           |
| 16.50        |
| 22           |
| 27.50        |
| 33           |
|              |



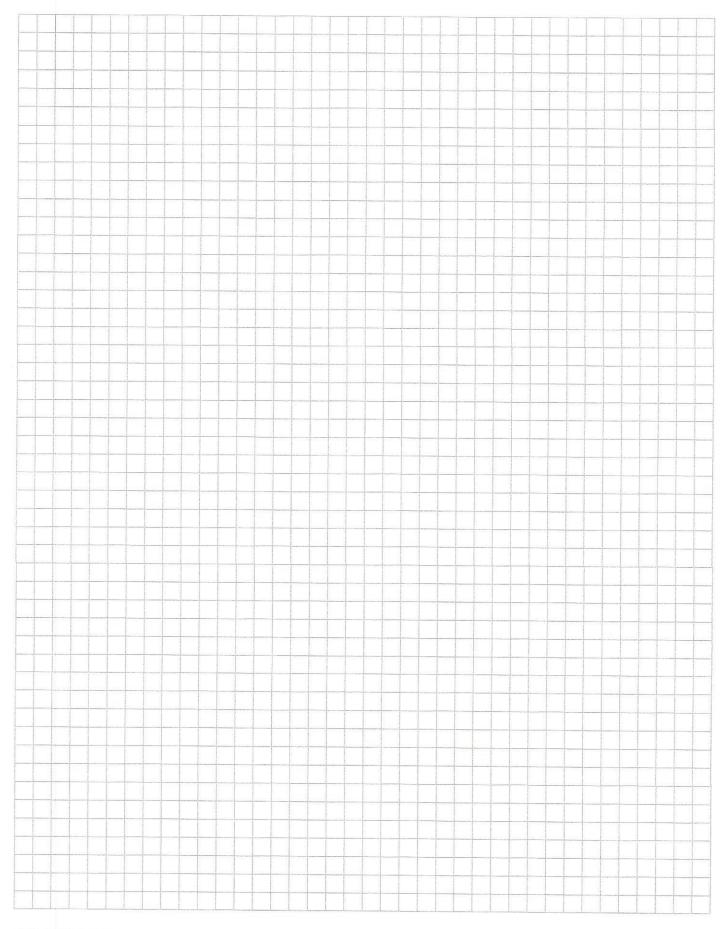
- 10. Write an equation for Mariah's earnings after thours.
- 11. Graph this equation.

\* on graph paper \*

12. How can you use the table to determine Mariah's earnings for 7 hours and for 9 hours?

Day 9

name:



### CARICATURES AT THE FAIR

#### **Verbal Description**

At a fair, Bob draws caricatures. He pays the fair \$30 for space to set up a table and \$2 for each drawing he sells.

Write and graph an equation to represent the total amount of money Bob pays the fair in order to sell his caricatures. Let x = the number of caricatures he sells.

#### **Equation**

Define your variables:

y = total money paid

x = number of caricatures

Write your equation:

Table of Values

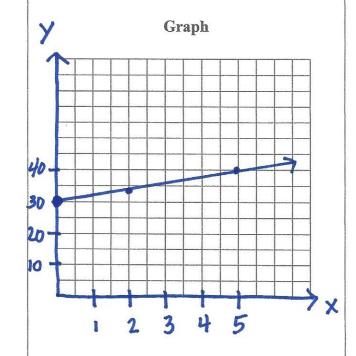
| X | Y  |
|---|----|
| 0 | 30 |
| 2 | 34 |
| 5 | 40 |

Points to Graph:

(0,30)

(2,34)

(5,40)



### T-SHIRT SHOP

#### **Verbal Description**

Your new job is at the Custom T Shop, where T-shirts are printed to order. For each order, Custom T Shop charges \$8.00 per shirt plus a one time set up fee of \$15.00.

Write and graph a linear equation to show how the total cost of the T-shirts depends on how many T-shirts are ordered

### Equation

Define your variables:

y =

x =

Write your equation:

y =

#### Table of Values

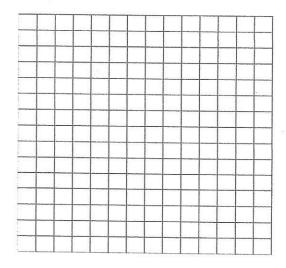
| X | Y |
|---|---|
|   |   |
|   | 7 |
|   |   |
|   |   |

Points to Graph:

 $( \quad , \quad )$ 

( , )

( , )



### **TOWING SERVICE**

### **Verbal Description**

When a tow truck is called, the cost of the service is \$10 plus \$1 per mile that the car must be towed.

Write and graph a linear equation to represent the total cost of the towing service, which is dependent on the number of miles the car is towed.

Find and interpret the slope and y-intercept of the linear equation

### Equation

Define your variables:

y =

 $_{\rm X} =$ 

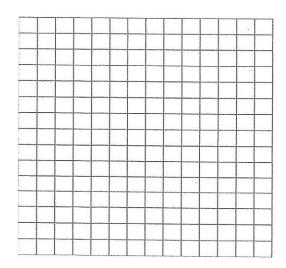
Write your equation:

y =

#### Table of Values

| X | Y |
|---|---|
|   |   |
|   |   |
| - |   |
|   |   |

Points to Graph:



### RENTAL CAR

### **Verbal Description**

The rental rate at Rent a Wreck is \$30 per day plus \$0.25 per mile driven.

Write and graph a linear equation to represent the total cost to rent a car for *x* number of miles.

### Equation

Define your variables:

y =

 $\mathbf{x} =$ 

Write your equation:

y =

### **Table of Values**

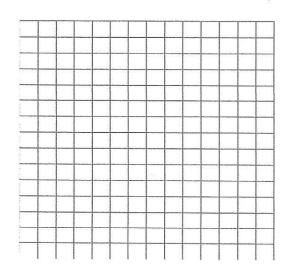
| X | Y  |
|---|----|
|   |    |
|   | 17 |
|   |    |
|   |    |
|   |    |

Points to Graph:

 $( \quad , \quad )$ 

( , )

( ,



### **PLUMBER**

### Verbal Description

When a plumber is called, the cost of the service call is \$50 for him to show up at your house, plus an additional \$25 per hour.

Write and graph an equation to represent this relationship where *y* is the total cost of the service call and *x* is the number of hours the plumber is at your home.

Find and interpret the slope and y-intercept of the linear equation

### Equation

Define your variables:

y =

x =

Write your equation:

y =

#### **Table of Values**

| X | Y |
|---|---|
|   |   |
|   |   |
|   |   |
|   |   |
|   |   |

Points to Graph:

( , )

( , )

 $( \quad , \quad )$ 

