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| Lesson Title: Rules from Tables and Graphs | | Pre 5.8 |
| Utah State Core Algebra Content Standard 2.3 Process Standards 1-5 | | |
| Summary | | |
| In this lesson, students describe the rule for the patterns found in tables of coordinate pairs and their graphs. Then they use rules to find coordinate pairs. | | |
| Enduring Understanding | Essential Questions | |
| Coordinate graphs tell stories about numeric patterns and relationships. Using a graph helps us make predictions. | How can graphs help us make predictions? | |
| Skill Focus | Vocabulary Focus | |
| <ul style="list-style-type: none"> Interpreting graphs | Linear | |
| Materials | | |
| Launch ideas | | |
| <ul style="list-style-type: none"> “Relate $y=5x$ to the pine-wood derby. As the car is going down the hill, it’s speed increases by 5 inches per second.” | | |
| Explore ideas | | |
| <ul style="list-style-type: none"> Students work in pairs. Make sure students are graphing correctly. Make sure the rule they choose is correct for all x’s. | | |
| Summarize ideas | | |
| <ul style="list-style-type: none"> “Have a discussion that all the rules give straight lines. In math we call this linear. Bring into the conversation “If x is this, then y equals that.” | | |
| Apply | | |
| Assess | | |

Pre 5.8

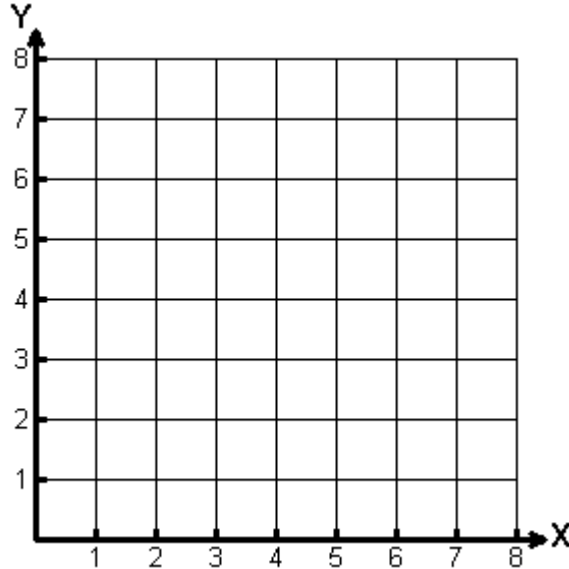
Rules from Tables and Graphs

Part I: Graph the coordinate points. Then find a rule for finding the second number from the first number in each coordinate pair.

1) Rule: _____

| x (first number) | y (second number) |
|------------------|-------------------|
| 0 | 2 |
| 1 | 3 |
| 2 | 4 |
| 3 | 5 |
| 4 | 6 |
| 5 | 7 |
| 6 | 8 |

What do you predict will happen when $x = 10$? When $x = 30$?

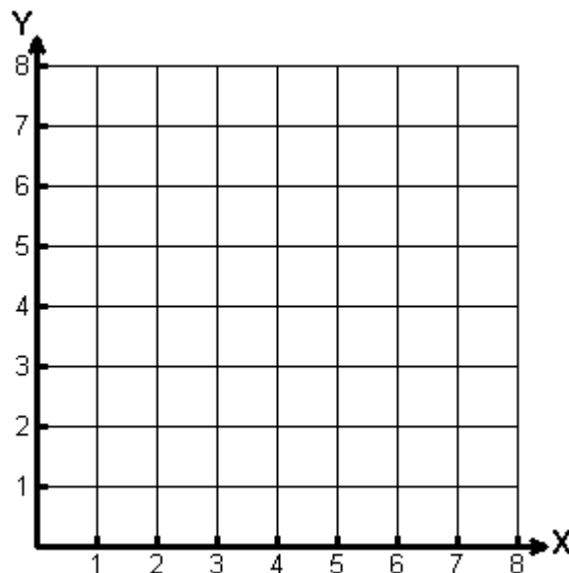


How does the graph show the rule?

2) Rule: _____

| x (first number) | y (second number) |
|------------------|-------------------|
| 0 | .5 |
| 1 | 1 |
| 2 | 1.5 |
| 3 | 2 |
| 4 | 2.5 |
| 5 | 3 |
| 6 | 3.5 |

What do you predict will happen when $x = 10$? When $x = 30$?

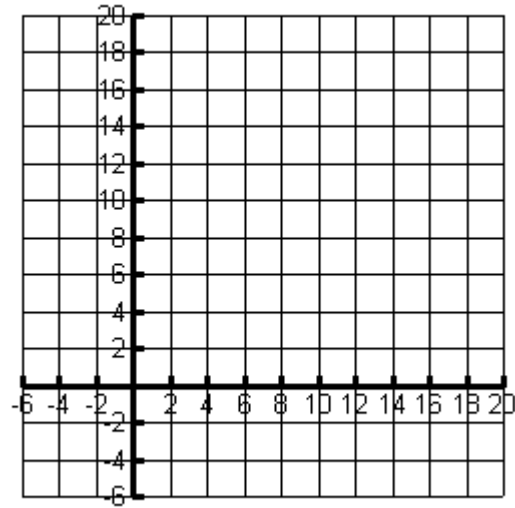


How does the graph show the rule?

3) Create a graph to help you find four more ordered pairs that fit this pattern:
 (3,10), (1,4), (0,1), (2,7), _____

Write a rule for the pattern of the table and graph?

Explain how the graph shows the rule.

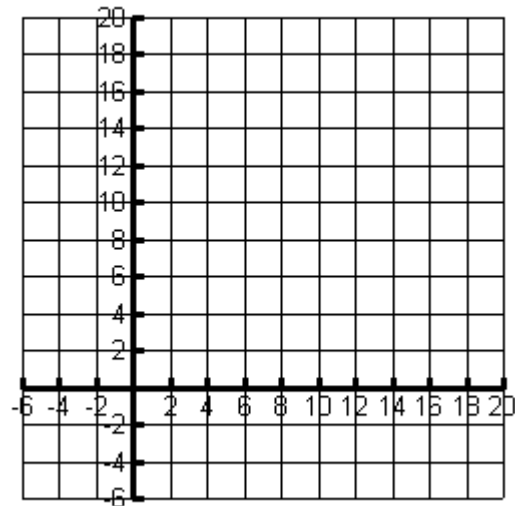


4) Create a problem. Draw a line on the graph.

Trade with a partner. Then figure out coordinate pairs for each other's graphs.

| x | y |
|---|---|
| | |
| | |
| | |
| | |

What is the rule for the pattern of the graph and table?



5) All but one of these ordered pairs fit a pattern: (1,2), (4,4), (7,6), (9,7), (13, 10), (16,12).
 Which pair does not fit the pattern? Explain why and give the correct ordered pair. (Graphing the points may help you find the pattern.)

Part II: Using Rules

1) Cari is 10 years old. If y stands for the number of years from now, which expression tells how old Cari will be ten years from now?

- a. $10 - y$ b. $10 * y$ c. $10 + y$ d. $y/10$

2) One pizza serves 6 people. If p stands for the number of pizzas Nick bought for his party, which expression tells how many people were served?

- a. $6 * p$ b. $p - 6$ c. $p/6$ d. $p + 6$

3) Complete each table. Use the rule to find the values that makes the sentence true.

| | | | | | |
|---|------|---|-----------|---|----------|
| d | 30-d | n | $n/5 - 2$ | w | $w + 25$ |
| 4 | | 10 | | 4 | |
| 7 | | 15 | | 7 | |
| 10 | | 20 | | 10 | |
| 11 | | 25 | | 11 | |
| 13 | | 30 | | 13 | |
| | | | | | |
| If $30 - d = 19$ $d = \underline{\hspace{2cm}}$ | | If $n/5 - 2 = 3$ $n = \underline{\hspace{2cm}}$ | | If $w + 25 = 43$ $w = \underline{\hspace{2cm}}$ | |

3) Complete the table using the rule. Then use the table to answer questions.

- a) Fran had s seashells. She found 2 more shells. Write an expression to show how many shells she had altogether.

| Shells (s) | $\frac{(s + 2)}{3}$ |
|----------------|---------------------|
| 4 | |
| 7 | |
| 10 | |
| 11 | |
| 13 | |

- b) Fran divided the total number of shells she had among 3 friends. Write an expression to represent what she did.

- c) If each of Fran's friends received 5 shells after Fran divided them up, how many shells did Fran have to start with? Explain how you found your answer.

- d) Tim is thinking of a number, n . He doubles his number, then adds 4 to it. Write an expression that shows the result.

- e) If Tim's result is 50, what was Tim's starting number? Start with 20 and make a table using values of n . Stop when you think you know the answer.

4) Complete each table and answer the questions

| Regular (r) | Sale price (r - 3) | Hours worked (h) | Amount Earned (2 * h) | n | n/3 | (n/3) + 1 |
|---|--------------------|--|-----------------------|---|-----|-----------|
| 10 | | 2 | | 3 | | |
| 11 | | 3 | | 6 | | |
| 12 | | 5 | | 12 | | |
| 16 | | 8 | | 15 | | |
| 18 | | 10 | | 18 | | |
| 20 | | 14 | | 24 | | |
| If the sale price is \$15, The regular price is_____. | | What value for h makes $2 * h = 16$ a true statement? _____ | | What value for n makes $n/3 + 1$ a true sentence? _____ | | |

5) Create your own problem with a rule. Trade with a partner to solve and graph.

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