# WARM-UP. . .

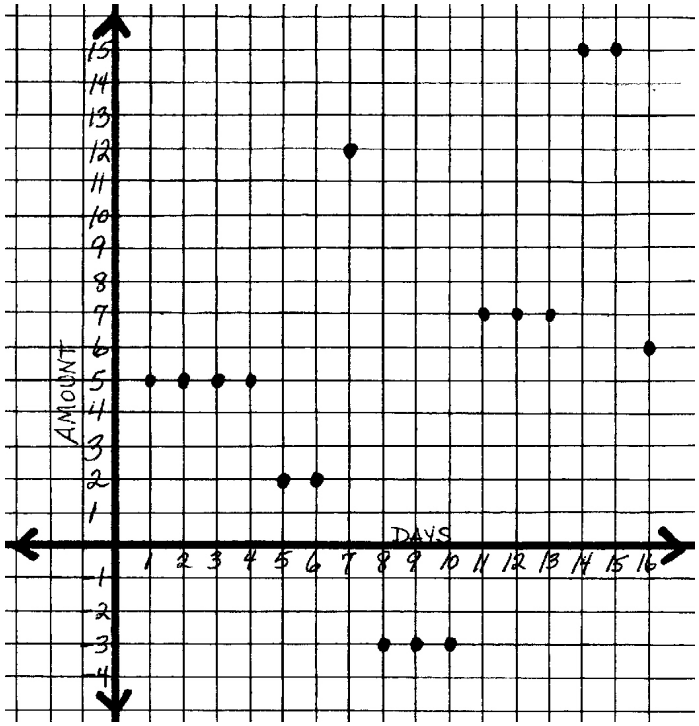
Graph Story

8th Grade Open Response Question

(Kentucky Dept. of Education)

**THE PROBLEM**

Look at the mystery graph given below. Write a story to describe the data shown on the graph.



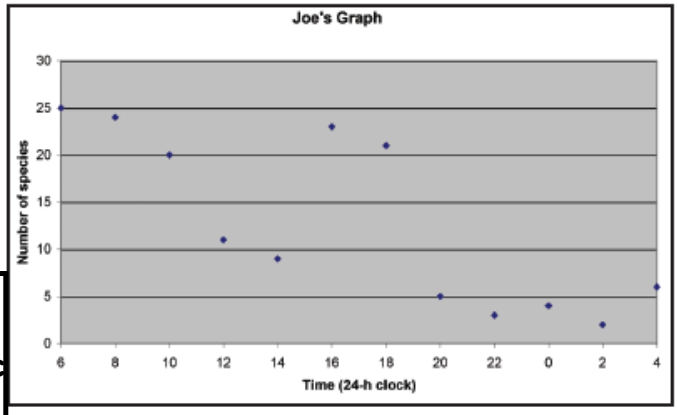
Here is what was considered a distinguished response...pretty good for grade 8!!

# 8th Grade Open Response Question
# Distinguished Response

Charlene started the week with no money, but found $5.00 in her coat pocket on Monday. On Friday after school she spent $3.00 for a paperback book, leaving her with a balance of $2.00. On Sunday she earned $10.00 by doing yard work for her neighbor. The balance on Sunday was then $12.00. On day 8, Monday, Charlene's friend, Sharee, called and asked if she wanted to go to the music store to buy the latest 'nSync CD. Since the CD cost $15.00 and Charlene only had $12.00, Sharee offered to loan her the money. Charlene took the loan, which left her with a negative cash balance of $3.00. On day 11, Thursday, Charlene earned another $10.00 by doing yard work and had $7.00 left after paying her $3.00 debt to Sharee. On day 14, Sunday, Charlene earned another $8.00, giving her a new cash balance of $15.00. On day 16, Tuesday, Charlene went to the mall with Sharee and spent $9.00 for a sparkly pen and writing notebook. Her final cash balance on day 16 was $6.00.

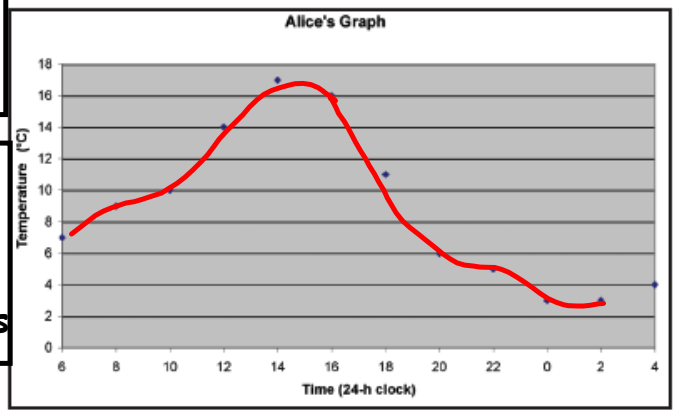
Does each graph represent a relation? A function? How can you tell?

Which of these graphs should have the data points connected? Explain.




**Discrete Data...**

- data is taken at specific times (counting)
- graph using dots




**Continuous Data...**

- there are no gaps
- graph using lines/curves

5.5 Graphs of Relations and Functions

# 5.4 Graphing Data

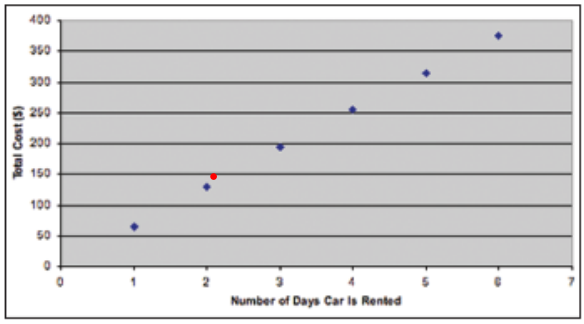
MATH LAB

**LESSON FOCUS** Graph data and investigate the domain and range when the data represent a function.

## Make Connections

Indep.

To rent a car for less than one week from Ace Car Rentals, the cost is $65 per day for the first three days, then $60 a day for each additional day.




| Number of Days Car Is Rented | Total Cost ($) |
|---|---|
| 1 | 65 |
| 2 | 130 |
| 3 | 195 |
| 4 | 255 |
| 5 | 315 |
| 6 | 375 |

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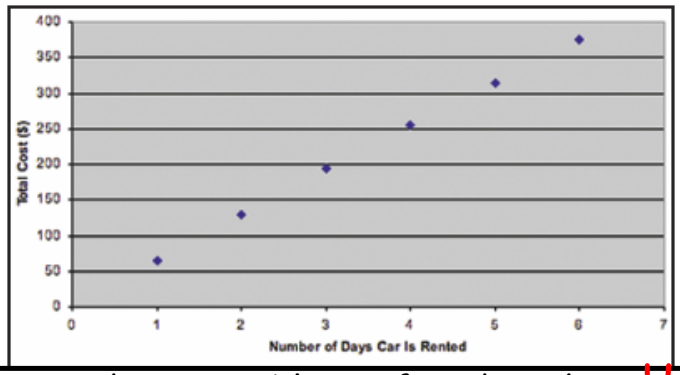



Dependent Variable: is found on the y axis.

Independent Variable: is found on the x axis.

Why are the points on the graph not joined?

Is this relation a function? How can you tell?

What is the domain? What is the range?

D: 1, 2, 3, 4, 5, 6

R: 65, 130, 195, 255, 315, 315

5.4 Math Lab: Graphing Data

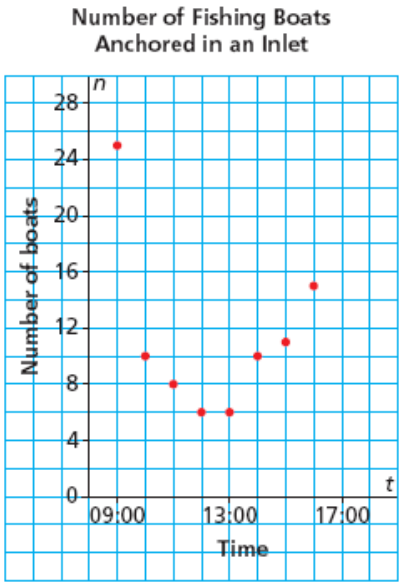
## Example 3 Determining the Domain and Range of the Graph of a Situation

This graph shows the number of fishing boats, $n$, anchored in an inlet in the Queen Charlotte Islands as a function of time, $t$.

a) Identify the dependent variable and the independent variable. Justify the choices.

b) Why are the points on the graph not connected? Explain.

c) Determine the domain and range of the graph.

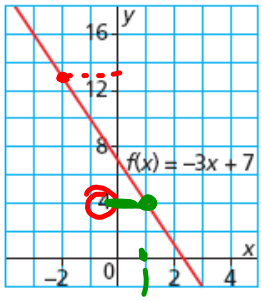


## Example 4 Determining Domain Values and Range Values from the Graph of a Function

Here is a graph of the function $f(x) = -3x + 7$.

a) Determine the range value when the domain value is $-2$.

b) Determine the domain value when the range value is 4.



Try This One... Is this graph a FUNCTION?

f(0) => "what is the y-value if x=0"

10) Given the graph, find the following:

(0,-5)
a) f(0) = -5

(1,-5)
b) f(1) = -5

(-5,2)
c) f(-5) = 2

(3,3)
d) f(3) = 3

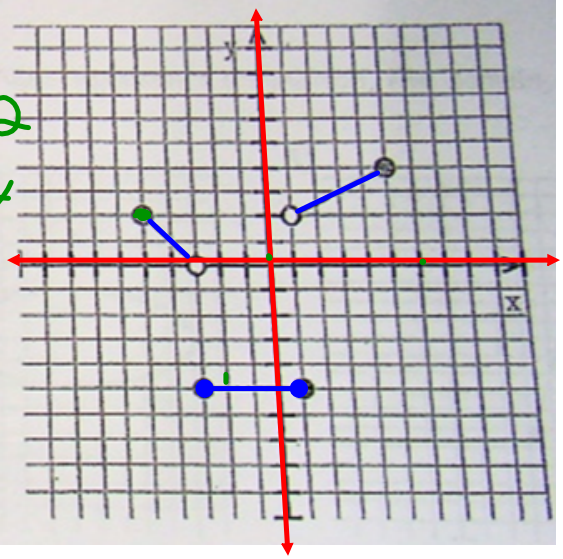
e) f(-3) = -5

f) f(5) = -4

g) f(-2) = -5

h) f(6) DNE

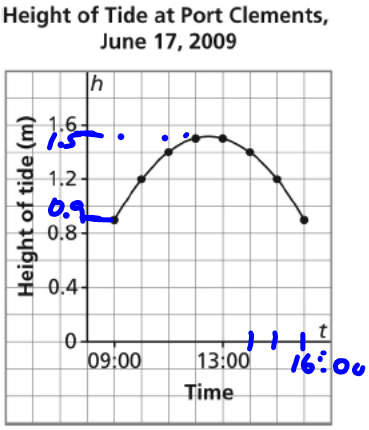
" Does Not Exist



# PRACTICE PROBLEMS...

p. 294: #9, 11, 12, 13, 14, 16

WARM UP: This graph shows the approximate height of the tide, $h$ metres, as a function of time, $t$, at Port Clements, Haida Gwaii on June 17, 2009.




(a) Dep. Var ⇒ h, height
Ind. Var. ⇒ t, time

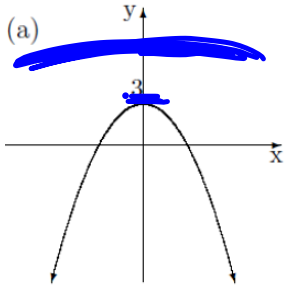
a) Identify the dependent variable and the independent variable. Justify your choices.
b) Why are the points on the graph connected? Explain.
c) Determine the domain and range of the graph.

Domain: $\{0900 \leq t \leq 1600\}$
$\{t \mid 9 \leq t \leq 16, t \in R\}$
Range: $\{0.9 \leq h \leq 1.5, h \in R\}$

## Review of domain and range...

Find the domain and range of the following functions from the graph. Use correct set notation

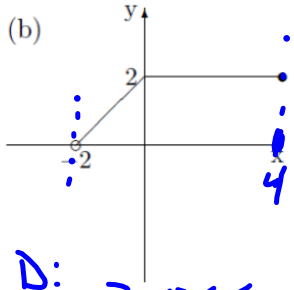
(a)




D: $x \in R$

R: $y \leq 3, y \in R$

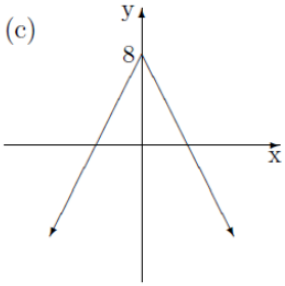
(b)




D: $-2 < x \leq 4$

R: $0 < y \leq 2$

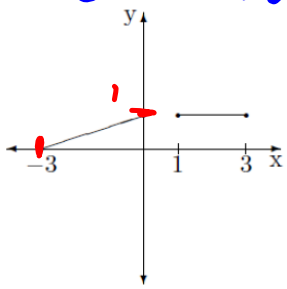
(c)

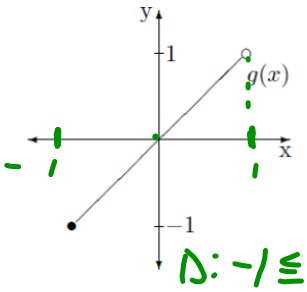



$8 \geq y$

D: $x \in R$

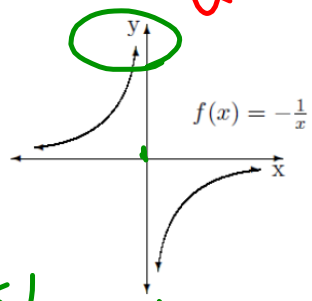
R: $y \leq 8$




D: $-1 \leq x < 1$

R: $-1 \leq y < 1$




D: $x \in R, x \neq 0$

R: $y \in R, y \neq 0$

Domain:

$\{-3 \leq x \leq 0$ or $1 \leq x \leq 3, x \in R\}$

Range: $0 \leq y \leq 1$

# REVIEW - Relations & Functions

- representing relations through...
  1) words (7,-4) 2) table 3) arrow diagram
  4) coordinate pairs 5) graph 6) equation $y = 7x + 5$
- desciribing the DOMAIN { x values } and RANGE { y values }
- identifying a FUNCTION (each x value has one and only one y value)
  * vertical line test... intersects more than one point - NOT a function
- INDEPENDENT (x variable) versus DEPENDENT (y variable)
- Function Notation... f(x) - same as the y variable (y is a function of x)

ex: f(x) = 3x + 1 a) f(-4) = f(32) (2, 3)

g(x) = -2x - 4 b) find x when f(x) = 32 (8, 3)

c) find f(g(-2)) =

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- Interpreting graphs...'telling the story' and answering questions.
  * must know how to read a distance/time graph
- DISCRETE (counting/gaps... use dots) versus
  CONTINUOUS (flows/no gaps...use lines/curves)

## REVIEW QUESTIONS...

* READ the study guide on p. 324 - 325
* PRACTICE from p. 326: #1 - 12
* PRACTICE TEST: → omit #2

  All questions except 5e & 5f

$f(x) = 7x+3$ $\quad p = 3w+7$

$y = 7x+3$ $\quad g(w)$

## Attachments

Worksheet - Sketching Angles in Radians.doc

Warm-Up - Intro to Limits.docx

Review - Factoring.pdf

Worksheet - Factoring Review.doc

Worksheet - Function Notation.pdf