Describing Functional Relationships

Agenda

Warm-Up

HW Check

Notes

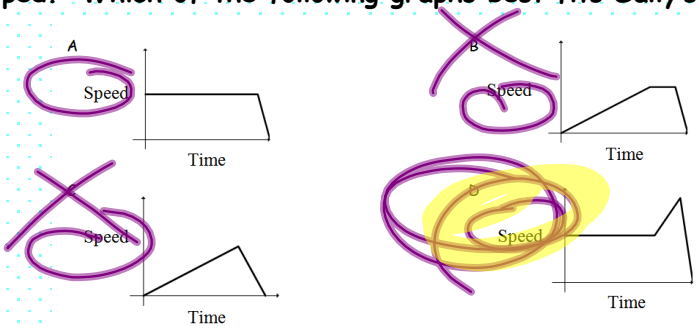
Stations

Homework

Practice 2 pages

Warm-Up

1. Sally rode her bike up a hill at a steady pace, then rode down the other side of the hill quickly on her bike. At the bottom she stopped. Which of the following graphs best fits Sally's bike trip?



2. The length of a rectangle is 5 cm more than its width. If the perimeter of the rectangle is 100 cm, find the length and width.

$l = 5 + w$

$2w + 2(5+w) = 100$

$2w + 10 + 2w = 100$

$4w + 10 = 100$

$4w = 90$

$w = 22.5$ cm

$l = 27.5$ cm

Homework Check

Answers:

1. 16 , 8, -4
2. 1, 3, -14
3. 7, -1, -10
4. 40, 0, -16
5. 0
6. 4
7. $x = 2$ and $x = 5$
8. $x = 0.5, 3, 4.5$
9. $x = 2, \quad 5 \leq x \leq 7$
10. Domain : $-1 \leq x \leq 7$
    Range : $0 \leq y \leq 6$
11. 294 miles
12. 14
13. 22
14. -1, 20, 59
15. f(☺)= 3☺² + 4☺ - 6
16. 45 pounds

Algebra I - Unit 3: Topic 1 - Evaluating Functions

Practice - Evaluating Functions **pp 245-251**

Name _____ Date _____ Period _____

Find values for the following functions:

	$f(x) = 3x + 7$	$g(x) = x^2 - 1$	$h(x) = 2(x - 5)$
1	$f(3) =$	$g(3) =$	$h(3) =$
2	$f(-2) =$	$g(-2) =$ $(-2)^2 - 1 = 4 - 1 = 3$	$h(-2) =$
3	$f(0) =$	$g(0) =$	$h(0) =$
4	$4[f(1)] =$	$-3[g(1)] =$	$2[h(1)] =$

$f(x) = y$

Use the graph to the right to answer the following questions.

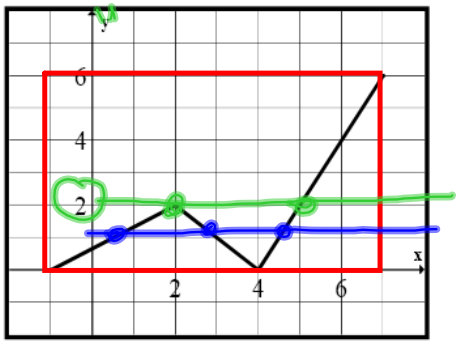
5. What is the value of *f(4)?*

6. What is the value of *f(6)?*

7. For what value or values of *x* does *f(x)* = 2? $x = 2$ or 5 $y = 2$

8. For what value or values of *x* does *f(x)= 1?* $y = 1$

9. For what *x*-values is *f(x)* greater than or equal to 2?



10. What are the domain and range of the function shown on the graph?

Algebra I - Unit 3: Topic 1 - Evaluating Functions

11. A recreational vehicle gets 21 miles per gallon. The relationship of the miles that the car can go to gallons of gas is expressed by the function $f(x) = 21x$, where x is the number of gallons of gasoline. Evaluate the function to determine the number of miles that the vehicle can travel on a full tank if the tank holds 14 gallons.

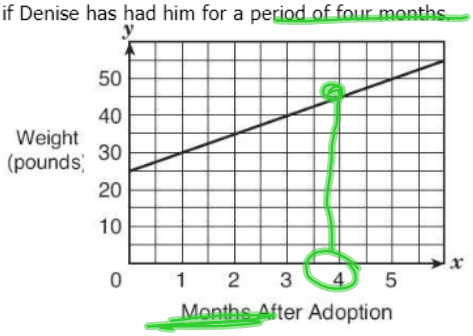
12. Find the 10^{th} term of the sequence that has the rule $A(n) = 32 + (n-1)(-2)$.

13. What is the input when the output is 58, using the function $A(n) = -5 + (n-1)(3)$?

14. If a function is defined by $f(x) = x^2 - 5$ and the domain is {2, 5, 8}, what are the dependent values?

15. If $f(x) = 3x^2 + 4x - 6$, then what is f(☺)?

16. The graph below shows the weight of Denise's dog Elmo over the 6-month period after she adopted him. Evaluate the function to determine the weight of Elmo, if Denise has had him for a period of four months.



dep variable = starting value + rate of change * ind variable

Algebra I – Unit 3: Topic 1 – Describing Functional Relationships

p. 44

1. A group of mountain climbers begin an expedition with 265 pounds of food. They plan to eat a total of 15 pounds of food per day.

A) Write an equation relating the remaining food supply, *r*, to the number of days, *d*.

$r = 265 - 15d$

ind: d
dep: r

B) After 11 days, how much food remains.

$r = 265 - 15(11)$

100 lbs

2. Jason borrowed money from his eccentric Aunt Bea to buy a lawn mower that costs $245. He decides to charge $18 to mow a lawn. Which equation below best describes the situation if Jason's profit, *p*, is a function of the number of lawns mowed, *n*?

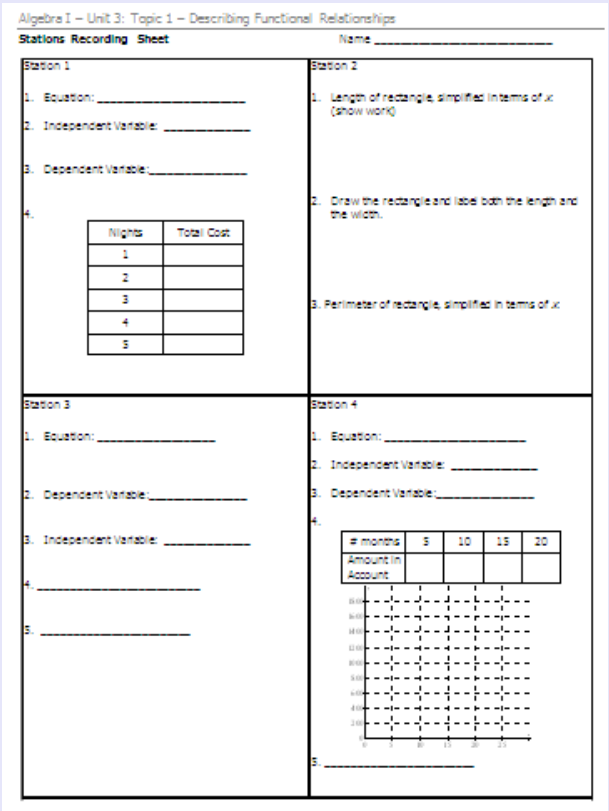
-245

A $p = 18n$

B $p = 18 + 245$

C $p = 18n - 245$

D $p = 245 + 18n$



Algebra I – Unit 3: Topic 1 – Describing Functional Relationships

Stations Recording Sheet Name _____

Station 1

1. Equation: _____
2. Independent Variable: _____
3. Dependent Variable: _____
4.

Nights	Total Cost
1	
2	
3	
4	
5	

Station 2

1. Length of rectangle, simplified in terms of x (show work)
2. Draw the rectangle and label both the length and the width.
3. Perimeter of rectangle, simplified in terms of x

Station 3

1. Equation: _____
2. Dependent Variable: _____
3. Independent Variable: _____
4. _____
5. _____

Station 4

1. Equation: _____
2. Independent Variable: _____
3. Dependent Variable: _____
4.

# months	5	10	15	20
Amount in Account				

5. _____

Finish @ least 3 stations

When the timer goes off, switch stations.

Algebra I - Unit 3: Topic 1 – Describing Functional Relationships

Stations – Describing Functional Relationships **No Textbook Correlation**

Station 1

Benji boarded his dog, Bruno, at Doggy Bark Hotel. It cost $25 per day for boarding and an additional $15 for grooming.

1. Write an equation that would find the total cost, *c*, of boarding and grooming Bruno for *d* days.

2. What is the independent variable?

3. What is the dependent variable?

4. Complete the table for boarding Bruno for the first five nights.

Station 2

A rectangle's length is 6 meters longer than twice its width. The width of the rectangle is (2x+3) meters.

1. What is the length of the rectangle, simplified in terms of *x*?

2. Draw a picture of the rectangle and label the length and width.

3. What is the perimeter, p, of the rectangle, simplified in terms of *x*?

Station 3

The Parker family is taking a vacation. During their vacation they will drive a total of 575 miles at an average speed of 55 miles per hour.

1. Write an equation that describes how many miles, m, remain after h, hours of driving.

2. What is the dependent variable?

3. What is the independent variable?

4. How many miles will they have left to drive after traveling for 7 hours?

5. After how many hours of driving will the Parker family have only 25 miles left to drive?

Station 4

Shannon has $2000 in her saving account when she starts withdrawing money. She takes $75 out of the account each month.

1. Write an equation that best describes the total amount, *t*, that remains in the account after *m*, months.

2. What is the independent variable?

3. What is the dependent variable?

4. Complete the table to find 4 points for this situation. Graph these points on the graph provided and connect to make the linear function. Make sure to label the axes.

5. After how many years will Shannon have $200 left in her account?

Algebra I - Unit 3: Topic 1 – Describing Functional Relationships

Station 5

Sara is going to save up to $35 each month to buy a MP3 player.

1. What do the words "save up to" indicate about this problem?

2. If the number of months is represented by m and the amount of money saved for the MP3 player is represented by t, write an inequality that represents this situation.

3. What is the independent variable?

4. What is the dependent variable?

5. Write a verbal description of the problem using the words "depends on" relating the independent variable and the dependent variable.

Algebra I - Unit 3: Topic 1

Practice – Describing Functional Relationships **No Textbook Correlation**

Name _____ Date _____ Period _____

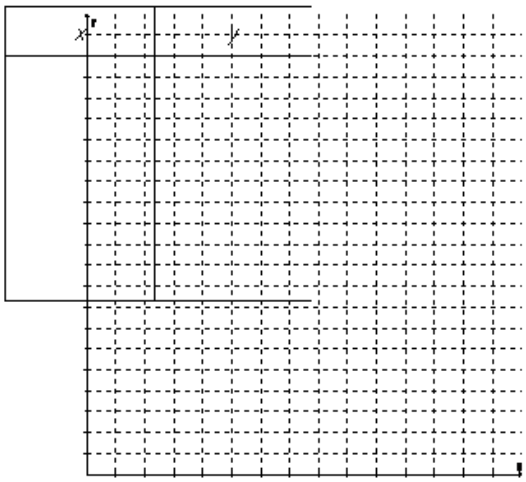
Russell does yard work on the weekends to earn spending money. He charges $3.50 an hour. He wants to buy an iPod that costs $130.

1. What is the independent variable?

2. What is the dependent variable?

3. Write a verbal description of the problem relating the independent variable and the dependent variable.

3. Complete the table below showing the relationship between the independent and dependent variables. Choose at least five values, for the independent variable, that would fit on the graph. {Label axes.}



5. Write an equation that describes the relationship between the independent and dependent variables.

6. How much money does Russell earn if he works for 8 hours?

7. About how many hours must Russell work before he earns half the amount he needs for the iPod?

8. About how many hours must Russell work before he earns enough to buy the iPod?

Algebra I - Unit 3: Topic 1

Jeremy works in a car wash and earns $5 per hour. This week he wants to earn at least $175.

9. What is the independent variable?

10. What is the dependent variable?

11. Complete the table to show how much he will earn for working the indicated number of hours.

# of Hours	Total Earnings
25	
26	
28	
29	
30	
40	
50	

12. Write an equation for Jeremy's total earnings, t, if he works h hours.

13. How many hours will he have to work to earn at least $175? Write your answer as an inequality.