

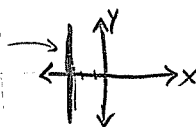
Chapter 6 Group Review

Name Key

Note: you don't need to graph these relations. I did just so we had a visual representation.

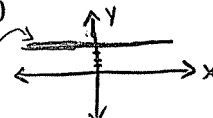
1. Determine the domain and range of the following (using inequalities and interval notation) and state whether or not it is a function.

a) $x + 3 = 0$
 $x = -3$



domain: $x = -3$
 range: $y \in \mathbb{R}$ or $(-\infty, \infty)$
 NOT a function

b) $y - 4 = 0$
 $y = 4$

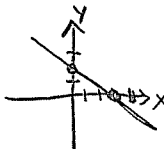


domain: $x \in \mathbb{R}$ or $(-\infty, \infty)$
 range: $y = 4$
 is a function

c) $2x + 3y = 6$

x-int: $y = 0$
 $2x + 3(0) = 6$
 $2x = 6$
 $x = 3$

y-int: $x = 0$
 $2(0) + 3y = 6$
 $3y = 6$
 $y = 2$



domain: $x \in \mathbb{R}$ $(-\infty, \infty)$
 range: $y \in \mathbb{R}$ $(-\infty, \infty)$
 is a function

2. Use the graph to the right.

A. Determine the value of x if $f(x) = -2$
 $y = -2$
 $x = -3$

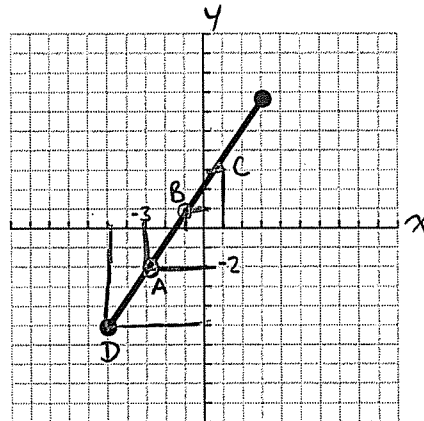
B. Determine the value of x if $f(x) = 1$
 $y = 1$
 $x = -1$

C. Find $f(1)$ $x = 1, y = 3$

D. Find $f(-5)$ $x = -5, y = -5$

E. Domain: $-5 \leq x \leq 3$ or $[-5, 3]$

F. Range: $-5 \leq y \leq 7$ or $[-5, 7]$



3. If $f(x) = 3x + 2$, find the value of x when $f(x) = 17$

$$17 = 3x + 2$$

$$-2 \quad -2$$

$$15 = 3x$$

$$\frac{15}{3} = \frac{3x}{3}$$

$$5 = x$$

4. State whether or not each of the following is a function or not and explain.

A. Multiply the number by 8 and add 3.

$$8x + 3$$

yes it is a function. Take a number, x ,
Mult by 8 + add 3 - only get one result.
"Each input # has only one output #"

B. $\{(-2,4), (-1,3), (0,2), (2,6), (3,-1)\}$

yes it is a function. All x -values are unique

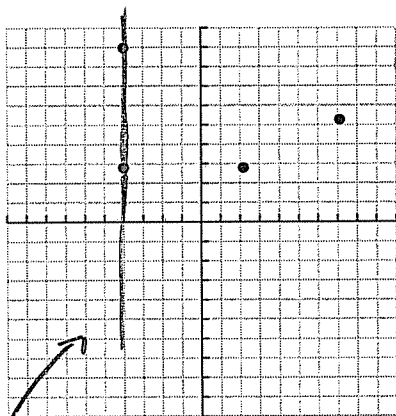
C. $\{(-2,4), (-1,4), (0,1), (4,2), (5,6)\}$

yes it is a function. All x -values are unique.

D. $\{(-2,4), (-1,3), (-1,1), (0,2), (2,6)\}$

When $x = -1$, there are two possible y -values so it is not a function

5. Determine the domain and range for the following graph.



Domain: $x = \{-4, 2, 7\}$

Range: $y = \{3, 5, 9\}$

Is this a function? no

Explain: Vertical line test - It is possible to draw a vertical line through more than one point \therefore not a function

6. Water is draining from a full 4620 L tank at the rate of 55 L per hour. Which of the following can be used to describe the volume, V , over time, t , in hours?
(there may be more than one)

Rate of change = $\frac{55L}{1h}$

$4620L \times \frac{1h}{55L} = 84h$

I.							
II.	<table border="1" style="margin: auto;"> <thead> <tr> <th>t</th> <th>V</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>4620</td> </tr> <tr> <td>84</td> <td>0</td> </tr> </tbody> </table>	t	V	0	4620	84	0
t	V						
0	4620						
84	0						
III.	$V = 4620 - 55t$ <p style="text-align: center;"> ↑ ↑ initial value rate of change </p>						

7. The profit, P , in dollars, made from a dance is given by the formula $P(n) = 5n - 800$, where n is the number of students attending the dance.

A. What is the domain of the function?

n is the set of whole numbers

$\{0, 1, 2, 3, \dots\}$ (the max. # of students is not indicated)

B. What is the profit if 300 people attend the dance?

$n = 300$ $P(300) = 5(300) - 800$
 $= 1500 - 800$

$P(300) = 700$
 Profit is \$700

C. What is meant by $P(190)$?

Profit when 190 student attend dance

8. Which ordered pair represents $f(3) = -5$?

- A. $(-5, 3)$
- B. $(-3, 5)$
- C. $(3, -5)$
- D. $(5, -3)$

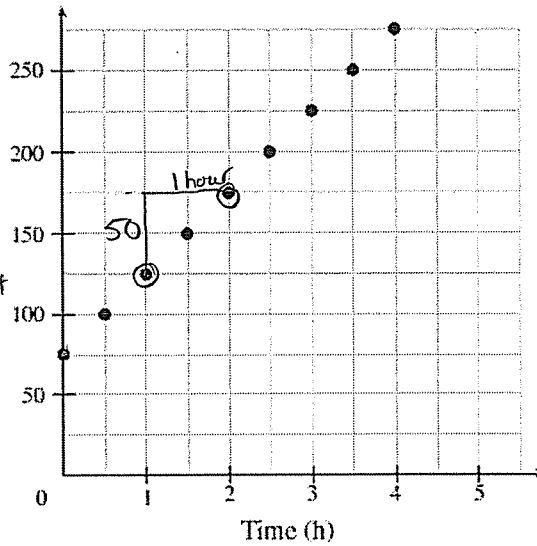
$f(x)$
 $x = 3, y = -5$

9. What is the cost of hiring an electrician for 8 hours?

- A. \$550
- B. \$475**
- C. \$400
- D. \$275

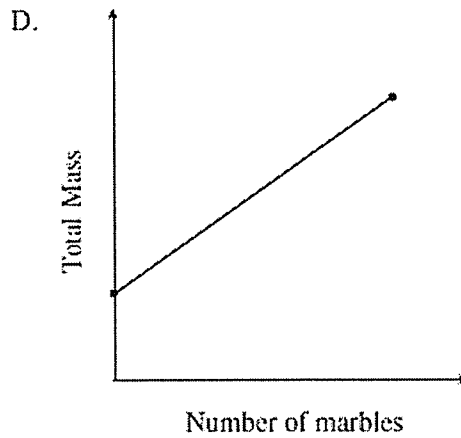
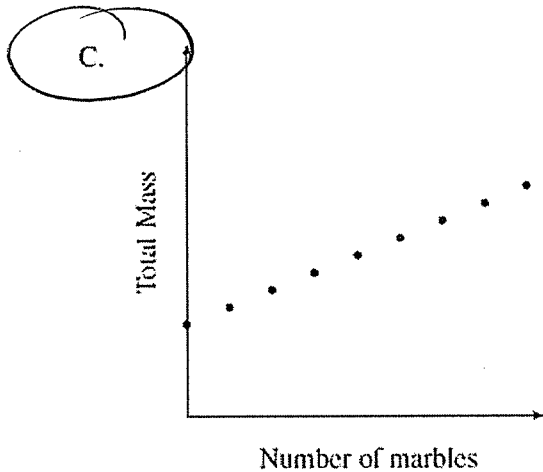
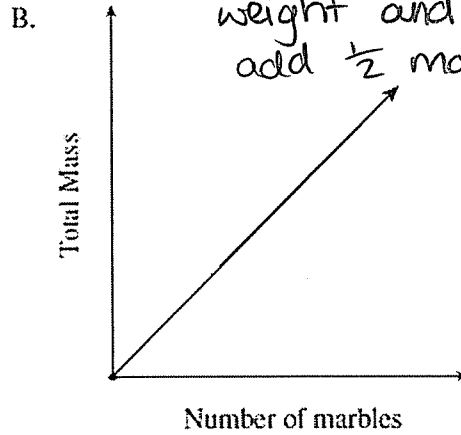
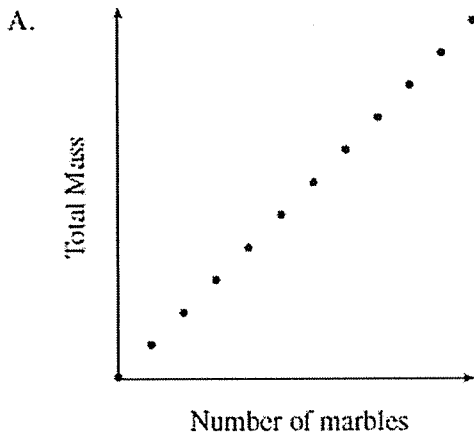
$\text{Rate of change} = \frac{\$50}{1h}$
dependent \downarrow *initial cost* \downarrow *rate of change*
 $C = 75 + 50h$ \leftarrow *independent*
 $C = 75 + 50(8)$
 $= 75 + 400$
 $C = 475$

Cost of Hiring an Electrician vs. Time



10. Marbles are placed in a jar one at a time. Which graph below best represents the total mass of the jar and marbles as the marbles are added?

note: Jar will have an initial weight and you can't add 1/2 marble.

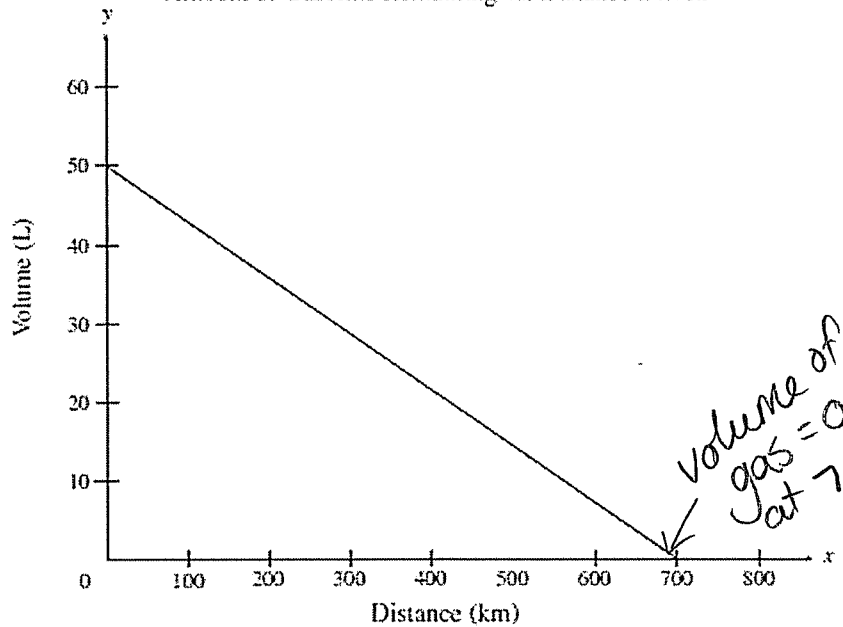


11. The graph shows the relationship between the amount of gasoline remaining in a 50L tank and the distance driven for a certain car.

Amount of Gasoline Remaining vs. Distance Driven

What does the x intercept represent in this situation??

- A. Fuel capacity of the gasoline tank
- B. Total distance travelled during a long trip
- C. Total distance driven until the car is out of gas**
- D. Number of kilometres driven per litre of gasoline



12. A helicopter is travelling toward its destination.

- a) Identify the dependent variable: *distance*
- b) Identify the independent variable: *time*
- c) Use the table of values to determine whether the relation is linear. *yes - diff is constant*
- d) Determine the rate of change.

Time (min)	Distance from Destination (mi.)
0	285
20	244
40	203
60	162
80	121

+20 (with arrows between rows)
-41 (with arrows between columns)

$$\frac{\text{change in dependent variable}}{\text{change in independent variable}} = \frac{244 - 285}{20 - 0} = \frac{-41 \text{ mi}}{20 \text{ min}} = -2.05 \frac{\text{miles}}{\text{min}}$$

- e) What does the rate of change represent?
Speed. travelling towards destination = 2.05 miles / minute.

- f) Assume the helicopter continues to travel at the same speed. How many more minutes will it take the helicopter to reach its destination? Give your answer to the nearest minute.

distance from initial distance away → $D = 285 - 2.05m$ ← *time rate*

when will D = 0?

$$0 = 285 - 2.05m$$

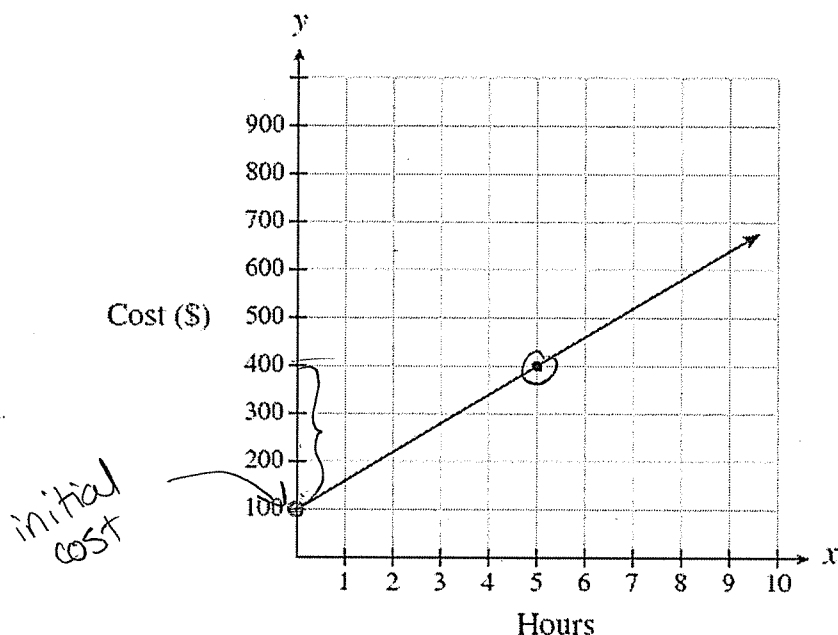
$$-285 = -285$$

$$\frac{-285}{-2.05} = \frac{-2.05m}{-2.05}$$

$$139 = m$$

About 139 minutes.

13. The following graph represents the cost of hiring a plumber to fix your leaky sink



What hourly rate does the plumber charge? Answer to the nearest dollar.

$$\text{rate} = \frac{\text{change in Cost}}{\text{change in Hours}} = \frac{\$300}{5h} = \frac{\$60}{h}$$

14. The total cost, C dollars, of a wedding reception dinner is represented by the function $C(n) = 100 + 30n$, where n represents the number of guests.

a) In this function, what does the 100 represent?

Initial cost

b) In this function, what does the 30 represent?

\$30/person (rate)

Challenge Yourself:

13. If $f(x) = 6x^2 - 2x + 1$, find $f(3x-1)$

$$\begin{aligned} f(3x-1) &= 6(3x-1)^2 - 2(3x-1) + 1 \\ &= 6(3x-1)(3x-1) - 6x + 2 + 1 \\ &= (18x-6)(3x-1) - 6x + 3 \\ &= 18x(3x-1) - 6(3x-1) - 6x + 3 \\ &= 54x^2 - 18x - 18x + 6 - 6x + 3 \\ &= 54x^2 - 42x + 9 \end{aligned}$$