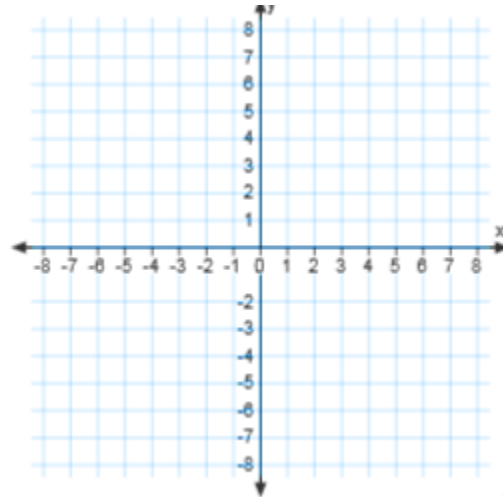


## Math 3 Honors Unit 1 Day 7 - Piecewise Word Problems

Warm-Up:

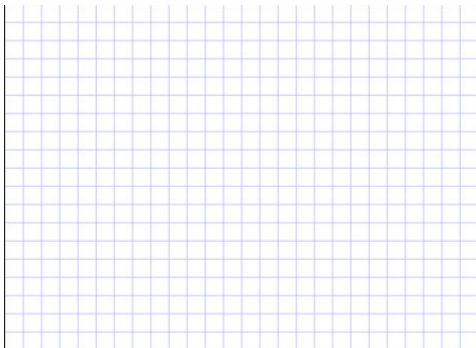
Graph the following piecewise graph.

$$f(x) = \begin{cases} 2x - 3, & \text{if } x \leq -2 \\ -2, & \text{if } -2 < x < 1 \\ (x - 3)^2 - 1, & \text{if } 1 \leq x < 5 \end{cases}$$



1. A car rental company charges a flat fee of \$45 to rent a car. In addition to that you must pay a fee per day you rent it. If you keep the car for 3 days or less, it costs \$7 per day. If you keep the car longer than 3 days it only costs \$5 per day.

a. Write a piecewise function to represent this situation and graph it.



Function:

b. How much does it cost to rent for 3 days? 4 days? What is weird about this?

2. A long distance calling plan charges 99 cents for any call up to 20 minutes in length and 7 cents for each additional minute or part of a minute.

a) How much would a call lasting 23 minutes cost?

b) What is the appropriate domain and range of this function?

c) Write a piecewise function to represent this situation from 0 minutes – 25 minutes.

3. The Ironman Triathlon is a race that consists of three parts: a 2.4 mile swim followed by a 112 mile bike race and then a 26.2 mile marathon. A participant swims steadily at 2 mph, cycles steadily at 20 mph and then runs steadily at 9 mph. Assume that no time is lost during the transition from one stage to the next.

a) What is our participant doing 3 hours into the race and 8 hours into the race (besides puking because I think that would be a given). Justify your answer.

b) How long before our participant/sadist finishes the race?

c) What is the appropriate domain and range of this function?

d) When does our participant change from the swim to the bike, and the bike to the run?

e) Write a piecewise function to represent this situation.

Math 3 Honors – Piecewise word problems WS

Name: \_\_\_\_\_

Date: \_\_\_\_\_

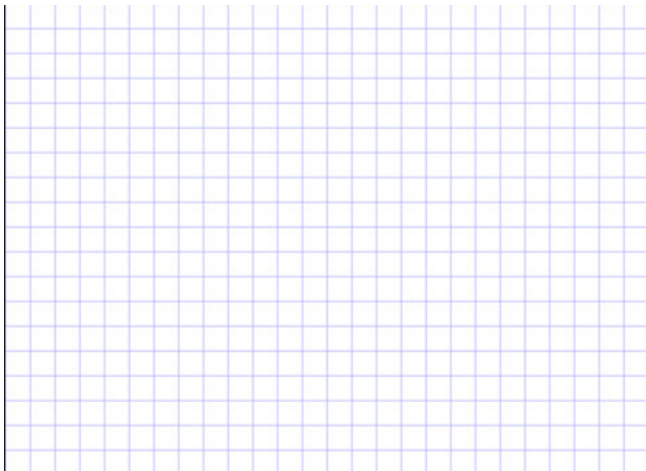
1. You have a summer job that pays time and a half for overtime. (If you work more than 40 hours) After that it is 1.5 times your hourly rate of \$7.00/hr.

a) How much money do you make working 35 hours?

b) How much money do you make working 50 hours?

c) What is the appropriate domain and range of this function?

d) Write the piecewise function that gives the amount made,  $M$ , as a function of hours worked,  $t$ . Then graph it.



Function:

e) Management decides to cap weekly pay at \$385. That means that you can never make more than \$385, regardless of how much you work. No, this isn't legal, but when does that stop anybody? What is the maximum number of hours you are willing to work in this scenario?

f) Write a new function to incorporate the weekly pay cap. What is the new domain and range of the function?

2. In May 2003, Nicor Gas had the following rate schedule for natural gas usage in single family residences.

Monthly Customer Charge	\$6.45
Distribution Charge	
1 <sup>st</sup> 20 therms	\$0.2012/therm
Next 30 therms	\$0.1117/therm
Over 50 therms	\$0.0374/therm
Gas supply charge	\$0.7268/therm

a) What is the charge for using 40 therms?

b) What is the charge for using 202 therms?

c) What is the appropriate domain and range for this function?

d) Construct a function that gives the monthly charge  $C$  for  $x$  therms of gas.