Writing Piecewise Functions

Name: _____

1) Your cell phone bill is structured as follows: the monthly fee is $29, which includes 30 free minutes of talk time. If you go over the 30 free minutes, there is an additional charge of $0.08 per minute for every minute over 30 minutes.

a) How much are you billed if you talk the following number of minutes:

14 minutes: 29 28 minutes: 29 30 minutes: 29

20 minutes: 29 68 minutes: 32.04 42 minutes: 29.96

b) Write a piecewise Function for the billing rate used by your sell phone company.

$29 \quad 0 < m \leq 30$

$29 + .08(m-30) \quad m \geq 30$

c) If your monthly bill was $35.12, how many minutes did you talk?

$29 + .08(m-30) = 35.12$

$.08(m-30) = 6.12$

$.08m - 2.4 = 6.12$

$.08m = 8.52$

$m = 106.5$

2) Redbox rents Blue Ray Movies for $2.50 for two days, and a late fee of $1.50 per day for every part of a day which the movie is returned after 9:00 p.m. All movies more than 17 days late will be billed to the customer at a charge of $34.

a) How much does it cost to keep the movie:

1 day: 2.50 7 days: 10 14 days: 20.50 3 days: 4

9 days: 13 20 days: 34 5 days: 7 189 days: 34

b) Write a piecewise function to describe the video rental charges.

$2.50 \quad 0 < d \leq 2$

$2.50 + 1.50(d-2) \quad 2 < d \leq 17$

$34 \quad d > 17$

3) Cheapo Car Rental charges the following weekly rate for an economy car: $55 per week with 50 free miles, and $0.20 per mile for all additional miles.

a) What is the rental charge for driving:

38 miles: 55 50 miles: 55 75 miles: 60 128 miles: 70.60

b) Write a piecewise function to represent the car rental fee schedule.

$55 \quad 0 < m \leq 50$

$55 + .20(m-50) \quad m > 50$

c) Jim's car rental bill was $127. How many miles did he drive?

$55 + .20(m-50) = 127$

410 miles

4) The LRHS Prom Committee is planning to hold the 2019 prom at the Raleigh Marriot Crabtree Valley. The hotel staff has agreed to provide the facility and all refreshments at the following rate schedule.

$1000 for up to 100 people
$10.50 per person for 101 to 225 people 2362.50
$10.20 per person for 226 to 500 people

a) How much will you be billed if the prom attendance is:

88 people: 1000 225 people: 2362.50 99 people: 1000

296 people: 3019.20 120 people: 1260 412 people: 4202.40

b) How many people attended the prom if the total bill was:

$1,806: 172 $10.50p = 1806 $3,213: 315 $10.20p = 3213

c) How much will it cost for 223 people? How much for 227 people? Does this seem fair? Explain what happened.

2341.50 2315.40

d) Write a piecewise function to represent the prom fee schedule charged by Marriot.

$1000 \quad 0 < p \leq 100$

$10.50p \quad 101 \leq p \leq 225$

$10.20p \quad 226 \leq p \leq 500$

Piecewise Functions: Absolute Value – Day 2 CW Name: _____

Graph each piecewise function. You may use a table of values. Be sure your final graph passes the vertical line test.

1) $f(x) = \begin{cases} 4 & if \quad x < -2 \\ |x| & if \quad -2 \le x \le 3 \\ -x & if \quad x > 3 \end{cases}$

-2	4
-3	4
-4	4

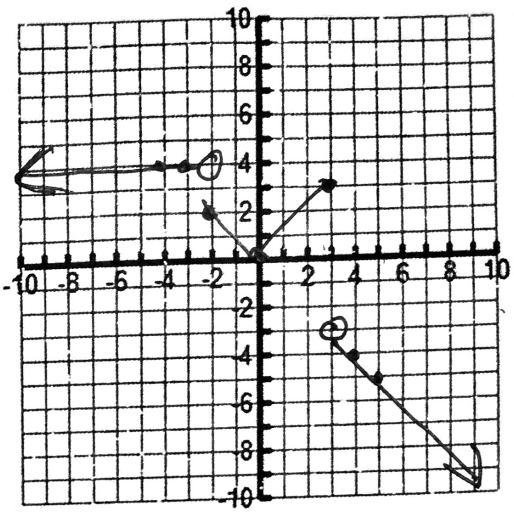
open

-2	2
0	0
3	3

closed, closed

3	-3
4	-4
5	-5

open



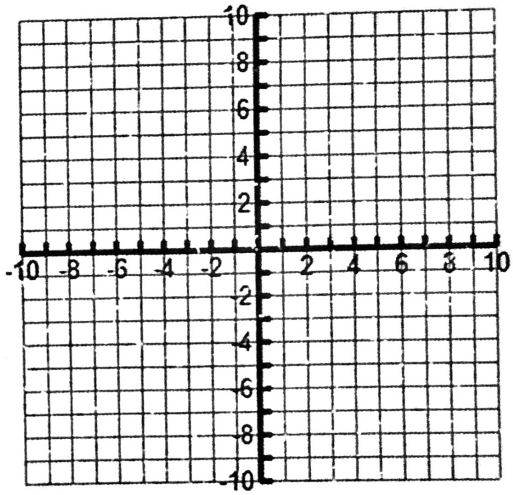
Domain: $x = \mathbb{R}$ or $x < -2 \cup -2 \le x \le 3 \cup x > 3$

Range: $y < -3 \cup 0 \le y \le 3 \cup y = 4$

Interval(s) of increasing: $0 < x < 3$

Interval(s) of decreasing: $-2 < x < 0 \cup x > 3$

2) $f(x) = \begin{cases} |x| & if \quad x < 2 \\ -x + 4 & if \quad x \ge 2 \end{cases}$



Domain: _____

Range: _____

Interval(s) of increasing: _____

Interval(s) of decreasing: _____

$|x-h|+k$

$2x+3=0$
$2x=-3$
$x=-3/2$

3) $f(x) = \begin{cases} |2x+3| & if \quad x \le -5 \\ x & if \quad -5 < x \le 1 \\ 4 & if \quad x > 1 \end{cases}$

$|2x+3|$

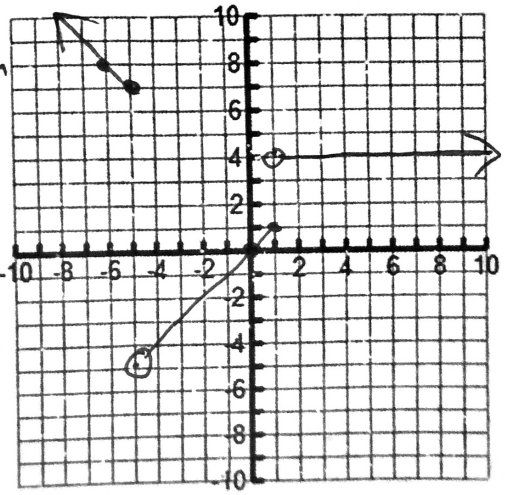
-5	7
-6	9
-7	11

closed

x open

-5	-5
0	0
1	1

close



Domain: $x = \mathbb{R}$

Range: $-5 < y \le 1 \cup y = 4 \cup y \ge 7$

Interval(s) of increasing: $-5 < x < 1$

Interval(s) of decreasing: $x < -5$