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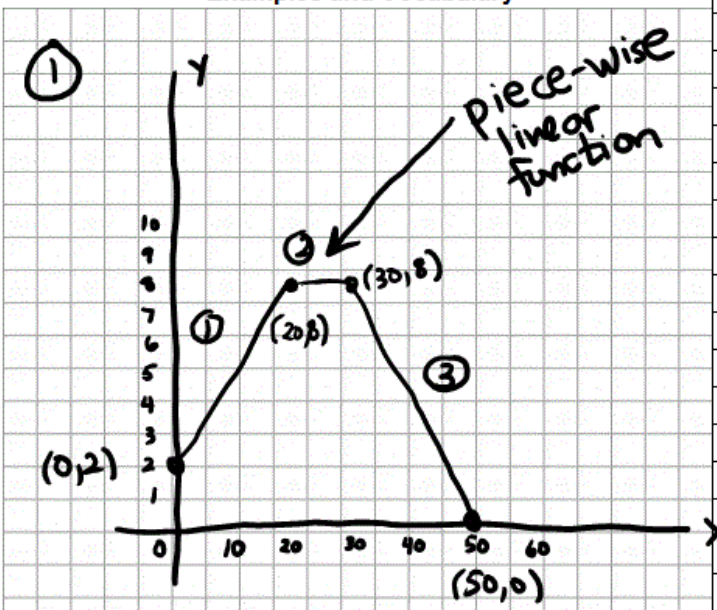
Class: Math 1301 Date: 3-7-13

Topic/Section:

Piece-wise Functions / Parallel and perpendicular lines

Examples and Vocabulary



y= thousands of gallons of water in a reservoir

x= elapsed hours

a. Is y= f(x)? Yes

b. Find the x- and y-intercepts and interpret.

Notes/Comments/Questions

① $y = mx + b = \frac{3}{10}x + 2$

$m = \frac{8-2}{20-0} = \frac{6}{20} = \frac{3}{10}$

② y = 8

③ $y = m(x - x_1) + y_1$

$m = \frac{0-8}{50-30} = \frac{-8}{20}$

$= -\frac{2}{5}$

$y = -\frac{2}{5}(x - 50)$

$$y = f(x) = \begin{cases} \frac{3}{10}x + 2, & \text{if } 0 \le x \le 20 \\ 8, & \text{if } 20 \le x \le 30 \\ -\frac{2}{5}(x-50), & 30 \le x \le 50 \end{cases}$$

y-int. = 2
Initially there is 2 thousands gallons in the reservoir.

x-int. = 50
The reservoir is empty after 50 hrs.

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Examples and Vocabulary	Notes/Comments/Questions
c. Write a formula for f.	

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Examples and Vocabulary	Notes/Comments/Questions
② $f(x) = \begin{cases} x-1, & \text{if } -4 \le x < 2 \\ -2x, & \text{if } 2 \le x \le 4 \end{cases}$	
a. Find the domain of f. $[-4, 4]$	
b. Evaluate.	
$f(-4) = -4-1 = -5$ $f(4) = -2(4) = -8$	
$f(0) = 0-1 = -1$ $f(6) =$ undefined	
$f(2) = -2(2) = -4$	

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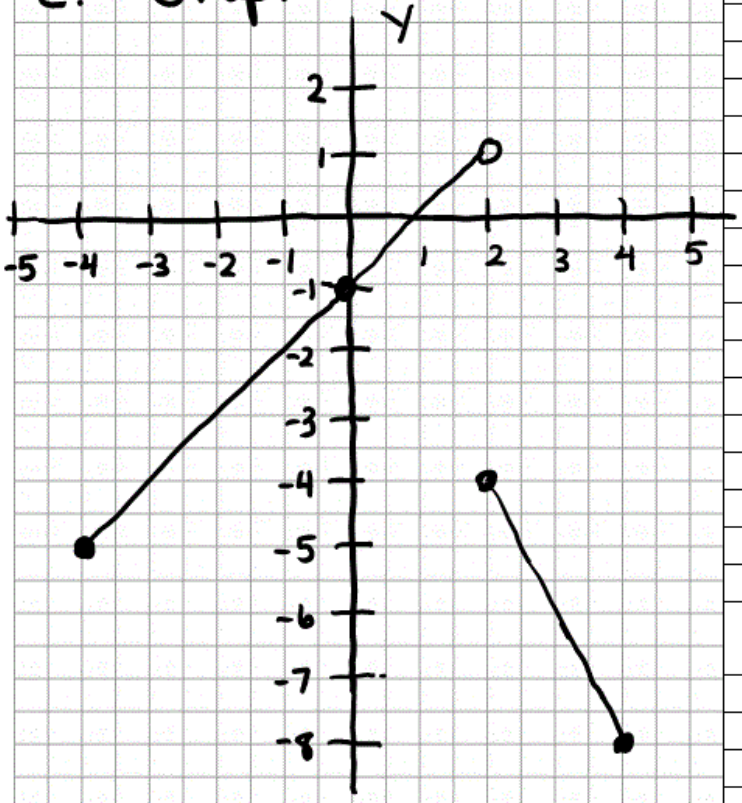
Examples and Vocabulary	Notes/Comments/Questions

c. Graph f.



$f(-4) = -4-1 = -5$

$f(0) = 0-1 = -1$

$f(2) = -2(2) = -4$

$f(4) = -2(4) = -8$

~~$f(6) =$ undefined~~

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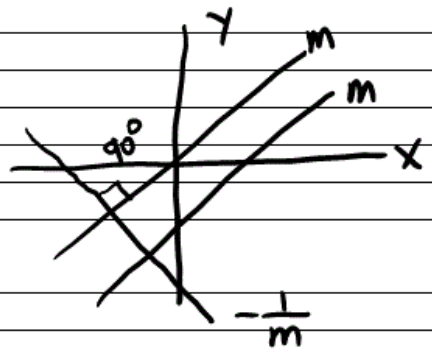
Examples and Vocabulary	Notes/Comments/Questions

Parallel lines are lines that do not intersect. Parallel lines have the some slope. Perpendicular lines are lines that intersect at a 90° (right) angle. Perpendicular lines have slopes that are negative reciprocals.



③ a. Find the formula for the line that is parallel to the line $y = 2x + 5$ and passes through $(-2, 5)$.

$5 = 2(-2) + 5 = 1$, false

$m = 2$ that contains $(-2, 5)$

$y = 2(x - (-2)) + 5$

$y = 2(x + 2) + 5$

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Examples and Vocabulary	Notes/Comments/Questions
b. Find the formula for the line that is perpendicular to the line $y = 2x + 5$ and passes through $(-2, 5)$. $m = -\frac{1}{2}$ contain $(-2, 5)$ $y = -\frac{1}{2}(x+2)+5$	