PROBLEMS AND SOLUTIONS - PIECEWISE-DEFINED FUNCTIONS

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PLEASE NOTE THAT YOU CANNOT ALWAYS USE A CALCULATOR ON THE ACCUPLACER - COLLEGE-LEVEL MATHEMATICS TEST! YOU MUST BE ABLE TO DO SOME PROBLEMS WITHOUT A CALCULATOR!

Problem 1:

The function f is defined as

$$f(x)=\begin{cases} x+3 & \text{if } x\le 0 \\ 3 & \text{if } 0<x<2 \\ 2x-1 & \text{if } x>2 \end{cases}$$

(a) Find $f(0)$, $f(1)$, $f(2)$, and $f(3)$.

(b) Determine the coordinates of the intercepts of the function.

(c) Graph the function.

Problem 2:

The function g is defined as

$$g(x)=\begin{cases} 3x-1 & \text{if } x<2 \\ -x+3 & \text{if } x>4 \end{cases}$$

(a) Find $g(0)$, $g(4)$, and $g(5)$.

(b) Determine the coordinates of the intercepts of the function.

(c) Graph the function.

Problem 3:

The function h is defined as

$$h(x)=\begin{cases}\frac{5}{4}x+\frac{5}{4} & \text{if } x<3\\ -3x+12 & \text{if } x\geq 3\end{cases}$$

(a) Determine the coordinates of the intercepts of the function.

(b) Graph the function.

Problem 4:

The function f is defined as

$$f(x)=\begin{cases}2x+1 & \text{if } x>2\\ 2x+1 & \text{if } x<2\end{cases}$$

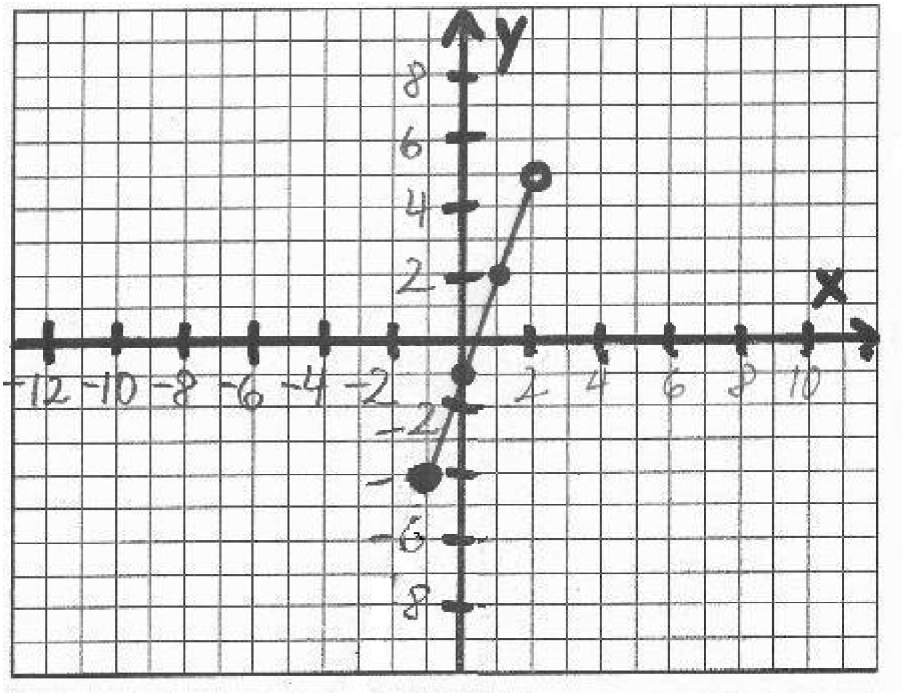
Please note that all branches are linear functions! In this case, the functions only differ in their domain restrictions.

(a) Determine the coordinates of the intercepts of the function.

(b) Graph the function.

Problem 5:

Find the domain and range of the following function. Write them in *Interval Notation*.



Problem 6:

The function g is defined as

$$g(x)=\begin{cases}\sqrt{x+1} & \text{if } x \geq -1 \\ |x+1| & \text{if } x < -1\end{cases}$$

(a) Determine the coordinates of the intercepts of the function.

(b) Graph the function.

SOLUTIONS

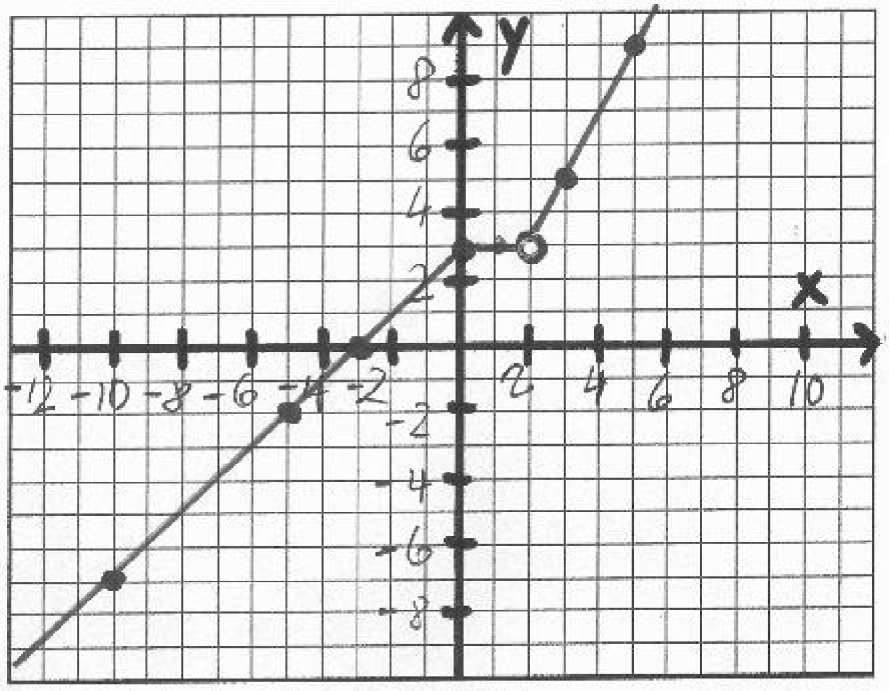
You can find detailed solutions below the link for this problem set!

1.a. ***f(0) = 3***, ***f(1) = 3***, ***f(2)*** does not exist, ***f(3) = 5***

1.b. x-intercepts: $(-3,0)$

y-intercepts: $(0,3)$

1.c. Graph of the function:

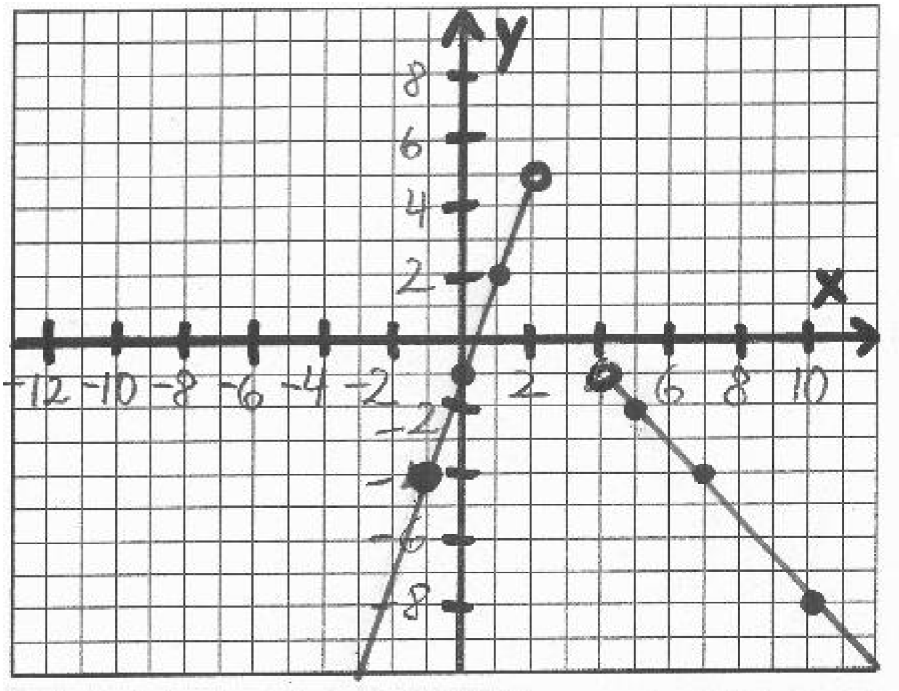


2.a. ***g(0) = -1***, ***g(4)*** does not exist, ***g(5) = -2***

2.b. x-intercepts: $(\frac{1}{3},0)$

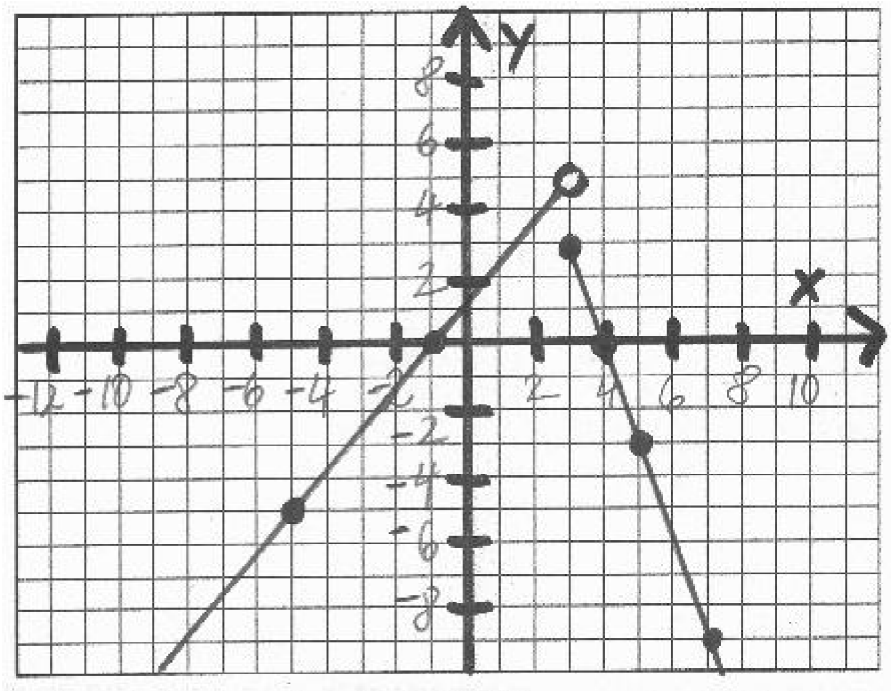
y-intercepts: $(0,-1)$

2.c. Graph of the function:



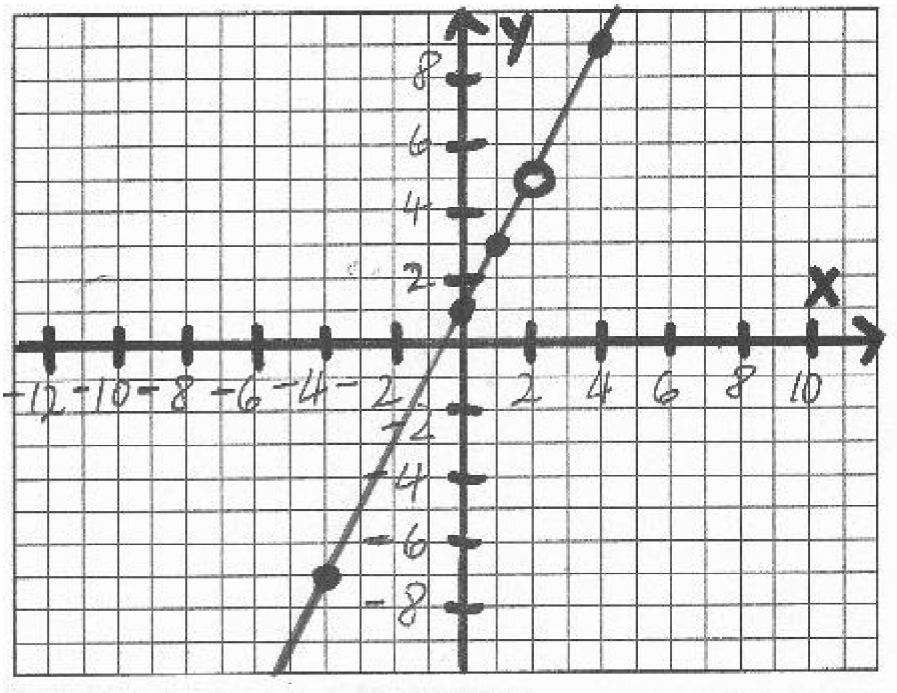
3.a. x-intercepts: ***(-1, 0)*** and ***(4, 0)***
y-intercepts: $(0, \frac{5}{4})$

3.b. Graph of the function:



4.a. x-intercepts: $(-\frac{1}{2}, 0)$
y-intercepts: ***(0, 1)***

4.b. Graph of the function:



5. Domain: ***[-1, 2)***
   Range: ***[-4, 5)***

6.a. x-intercepts: ***(-1, 0)***
   y-intercepts: ***(0, 1)***

6.b. Graph of the function: