

Name: _____

Date: _____

1-5 PIECEWISE LINEAR FUNCTIONS**FLUENCY**

1. For $f(x) = \begin{cases} 5x-3 & x < -2 \\ x+8 & -2 \leq x < 3 \\ \frac{1}{3}x+7 & x \geq 3 \end{cases}$ answer the following questions.

(a) Evaluate each of the following by carefully applying the correct formula:

(i) $f(2)$

(ii) $f(-4)$

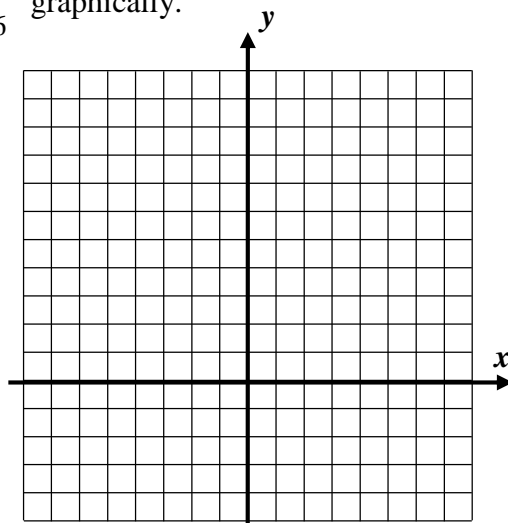
(iii) $f(3)$

(iv) $f(0)$

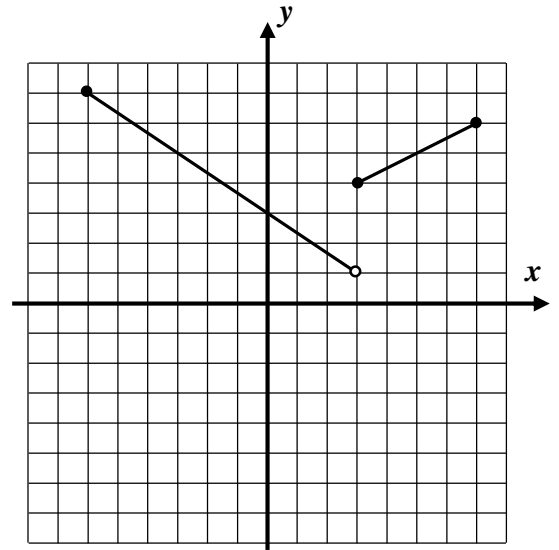
(b) The three linear equations have y -intercepts of -3 , 8 and 7 respectively. Yet, a function can have only one y -intercept. Which of these is the y -intercept of this function? Explain how you made your choice.

(c) Calculate the average rate of change of f over the interval $-3 \leq x \leq 9$. Show the calculations that lead to your answer.

2. Determine the range of the function $g(x) = \begin{cases} x+4 & -2 \leq x \leq 2 \\ -\frac{3}{2}x+9 & 2 < x \leq 6 \end{cases}$ graphically.



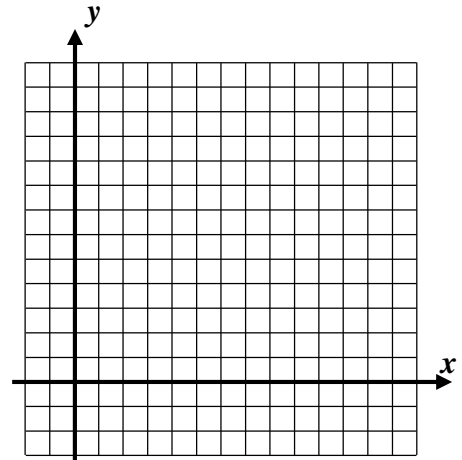
3. Determine a piecewise linear equation for the function $f(x)$ shown below. Be sure to specify not only the equations, but also the domain intervals over which they apply.



REASONING

4. Step functions are piecewise functions that are constants (horizontal lines) over each part of their domains. Graph the following step function.

$$f(x) = \begin{cases} -2 & 0 \leq x < 3 \\ 3 & 3 \leq x < 5 \\ 7 & 5 \leq x < 10 \\ 5 & 10 \leq x \leq 12 \end{cases}$$



5. Find all x -intercepts of the function $g(x) = \begin{cases} 2x+8 & -5 \leq x < -1 \\ -\frac{1}{2}x-4 & -1 \leq x < 1 \\ -4x+10 & 1 \leq x \leq 4 \end{cases}$ algebraically. Justify your work by

showing your algebra. Be sure to check your answers versus the domain intervals to make sure each solution is valid.