UNIVERSITY AT ALBANY
STATE UNIVERSITY OF NEW YORK

AMAT100 PreCalculus Exam 1A Spring 2025

Print Name:

UAlbany Email:

Directions: You have **80 minutes** to answer the following questions. ***You must show all necessary work*** as neatly and clearly as possible. Clearly indicate your final answers by placing a box or circle around it.

No calculators, notes, textbooks, mobile phones or other aids are allowed. Do not detach pages.

Problem	Possible	Points
1	10	
2	12	
3	10	
4	5	
5	8	
6	12	
7	12	
8	10	
9	9	
10	12	
Total	100	

(1) Simplify and rewrite without negative exponents.

$$\frac{\left(5m^{\frac{1}{2}}n^3\right)^2 (m^{-3}n^0)^4}{m^{-11}n^{-6}}$$

(2) Solve the inequality and *clearly express your final answer on a number line.*

$$|7 - 2x| + 1 \leq 13$$

(3) Let

$$f(x) = 1 - 3x^2.$$

Evaluate and simplify the difference quotient:

$$\frac{f(x+h) - f(x)}{h}.$$

(4) The number of likes a social media post receives depends on the number of hours it has been online. Let L represent the number of likes, and t represent the number of hours. A social media post received 750 likes after being online for 12 hours. Which of the following correctly represents this relationship in function notation? Circle one choice.

(a) $L(t) = 750 \times 12$

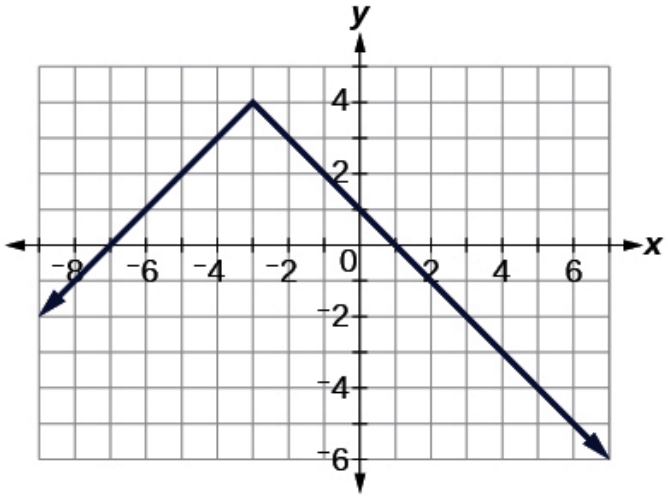
(b) $L(750) = 12$

(c) $L(12) = 750$

(d) $12 \times L(t) = 750$

(e) None of the above.

(5) Given the graph of f below, fill in the blanks:



(a) $f(4) =$ _____

(b) Find all values of x such that $f(x) = 1$.

$x =$ _____

(6) The table below gives some values of the functions f, g, and h. Here f, g, and h are invertible and defined for all values of x.

x	$f(x)$	$g(x)$	$h(x)$
3	8	-5	1
-5	7	11	-2

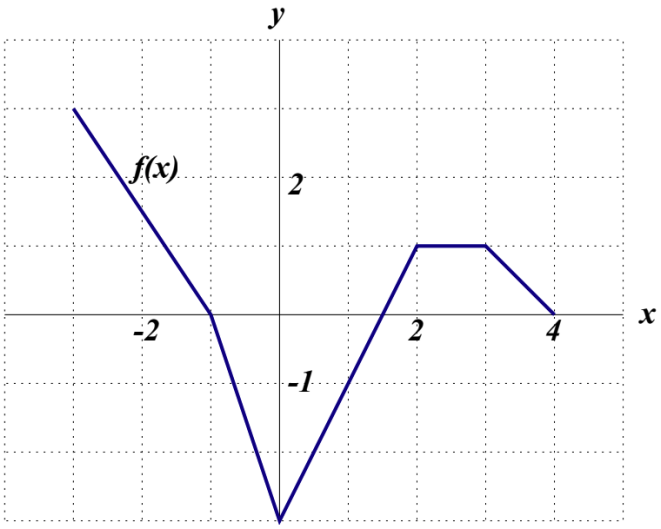
Evaluate each of the following expressions, or if the given information is insufficient, write "NEI" for not enough information.

(a) $f(g^{-1}(11))$=_____.

(b) $(h^{-1}(1))^{-2}$ =_____.(Your final answer should not include negative exponents.)

(c) $h(f(-5))$ =_____.

(7) The graph of $f(x)$ is given below on the interval $[-3, 4]$.

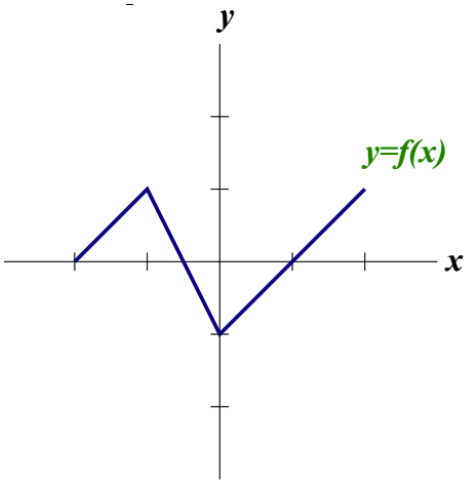


(a) State all of the intervals in which $f(x)$ is decreasing and positive.

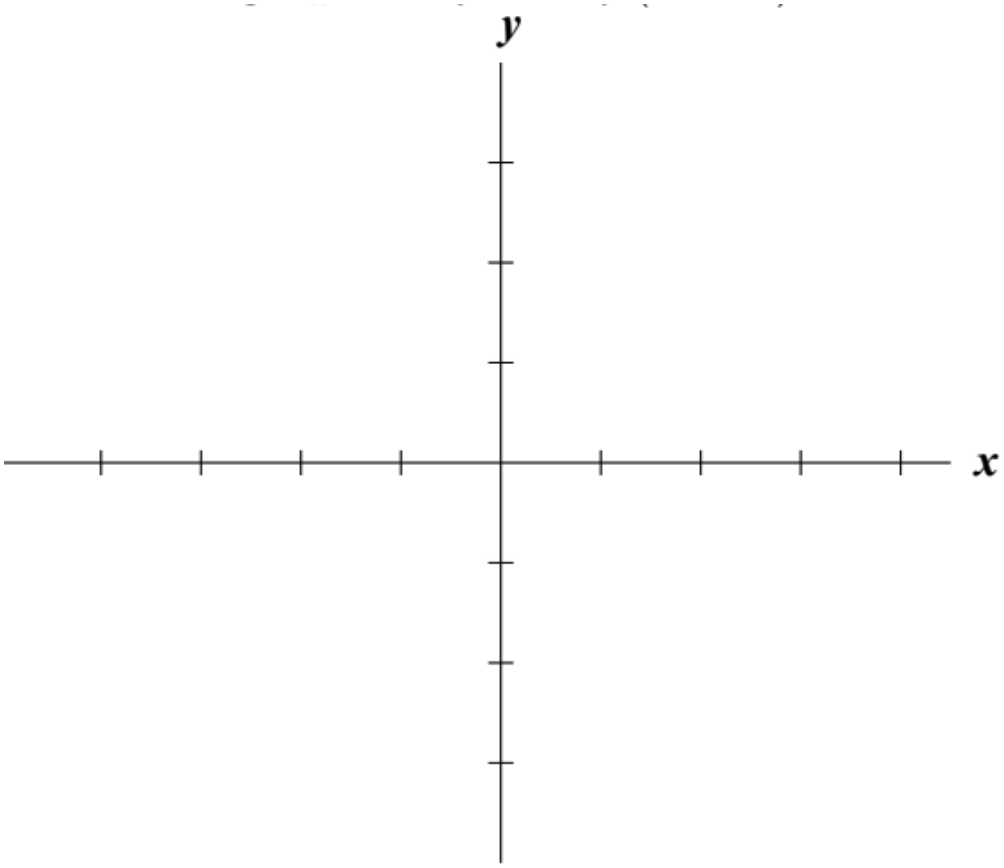
(b) Find the average rate of change between $x = -1$ and $x = 2$.

(c) An interval for which the average rate of change is zero is _____.

(8) The graph of $y = f(x)$ is drawn below. In each graph, a tickmark represents the same unit.



Draw the graph of $y = f(x + 2) - 1$.



(9) Find the domain of

$$h(x) = \frac{3x+5}{\sqrt{1-x}}.$$

Clearly express your final answer using interval notation.

(10) Find the inverse of

$$q(x) = \frac{7x-4}{3-x}.$$