



MITx: 15.053x Optimization Methods in Business Analytics



Bookmarks

▸ General Information

▸ Week 1

▼ Week 2

Lecture 2

Lecture questions due Sep 20, 2016 at 19:30 IST

**Recitation 2****Problem Set 2**

Homework due Sep 20, 2016 at 19:30 IST



Week 2 > Problem Set 2 > Problem 5

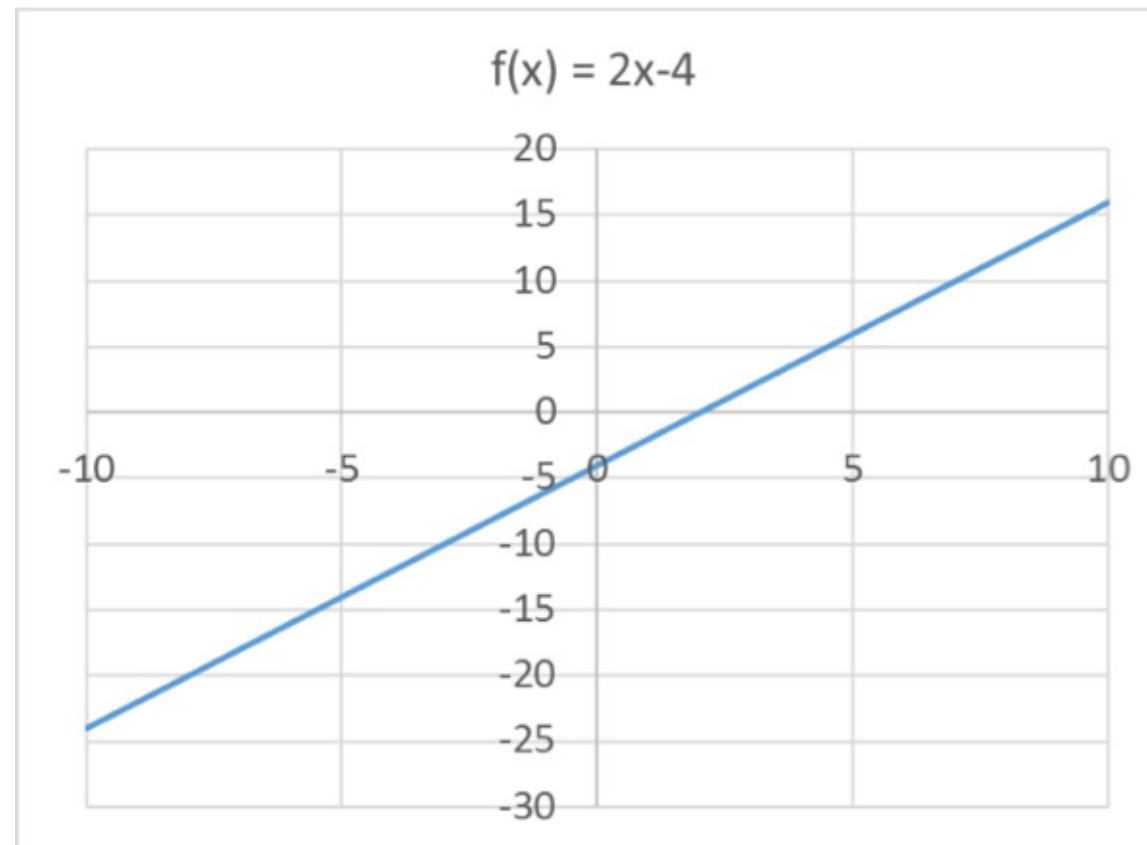


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PART A

(3/3 points)

For each function and accompanying graph, determine whether the function is convex or not.



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

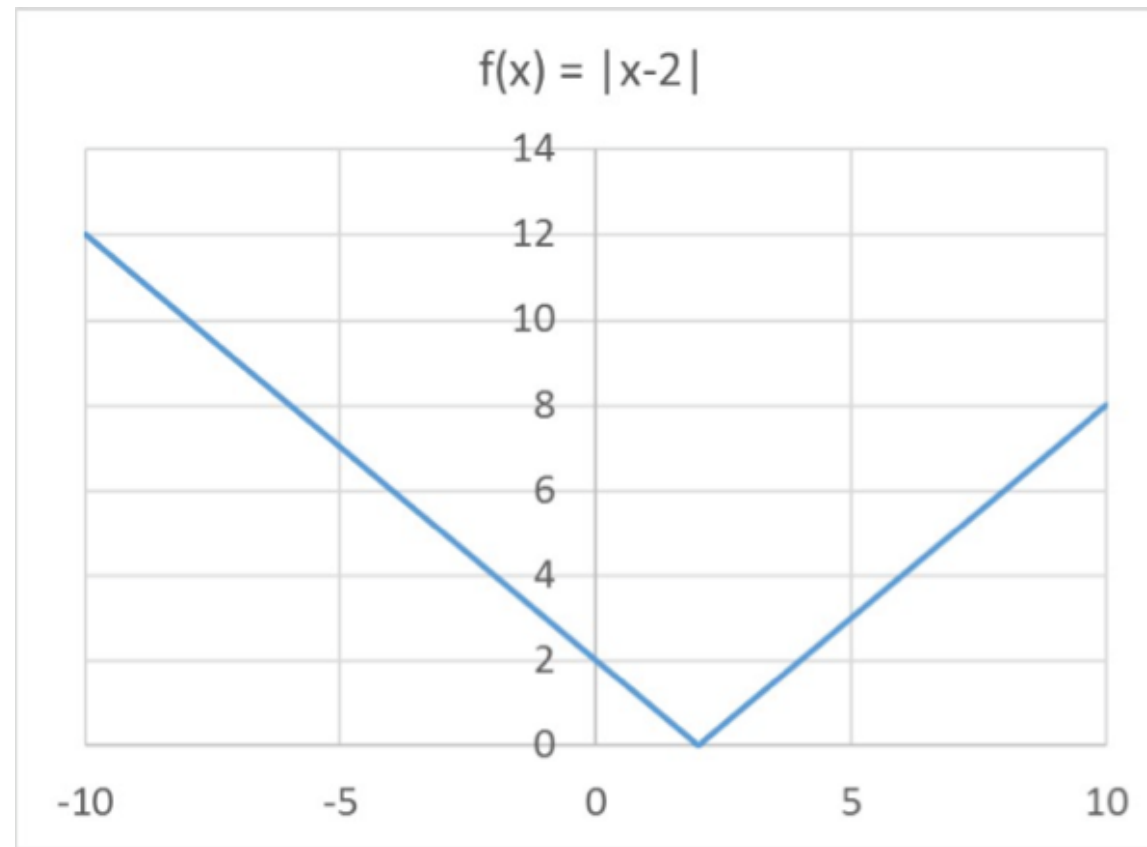
☐ Not Convex

☒ Convex ✓

You have used 1 of 3 submissions

PART B

(1/1 point)



$$f(x) = |x - 2|$$

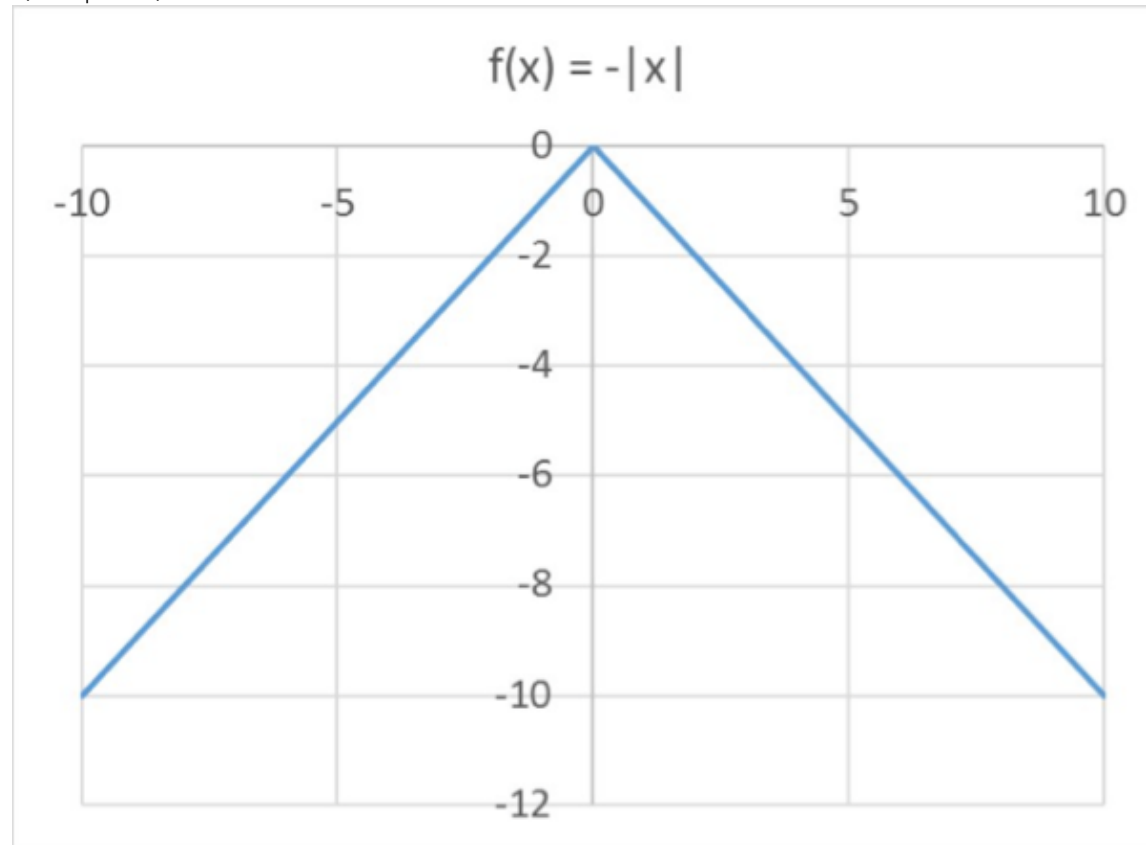
☐ Not Convex

☒ Convex ✓

You have used 1 of 1 submissions

PART C

(1/1 point)



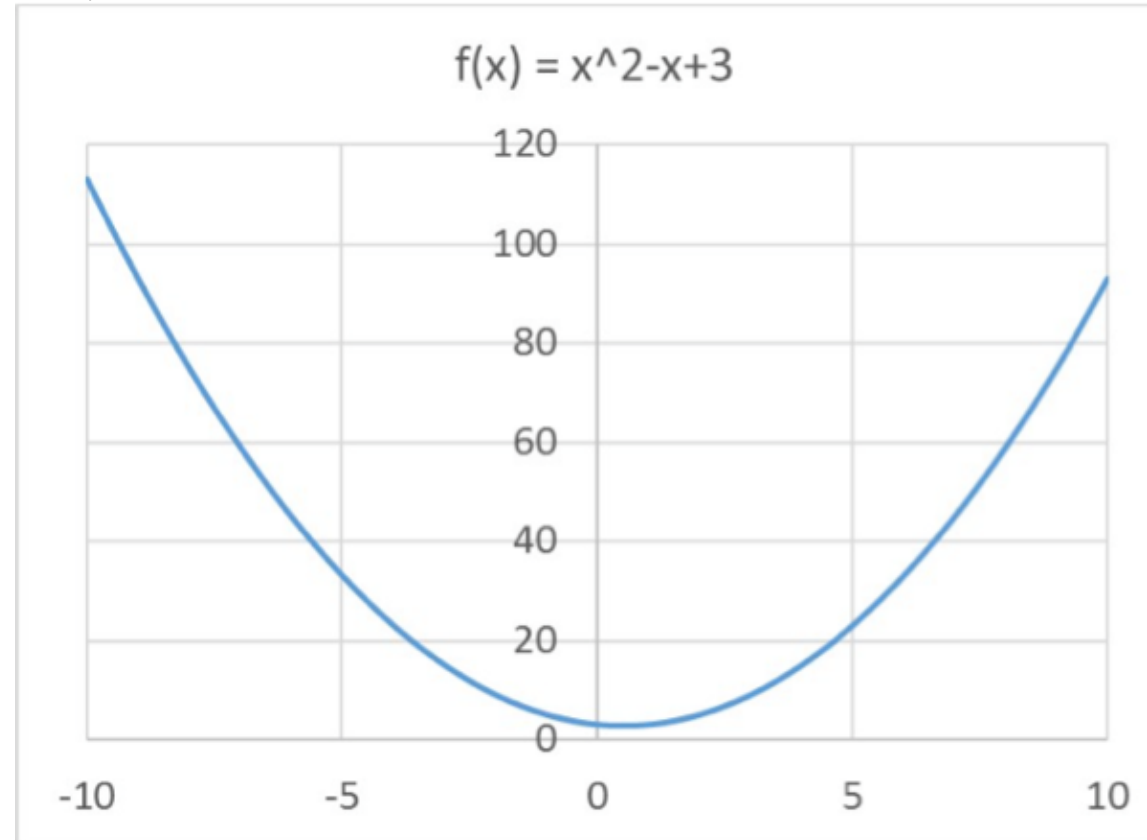
$$f(x) = -|x|$$

☒ Not Convex ✓☐ Convex

You have used 1 of 1 submissions

PART D

(1/1 point)



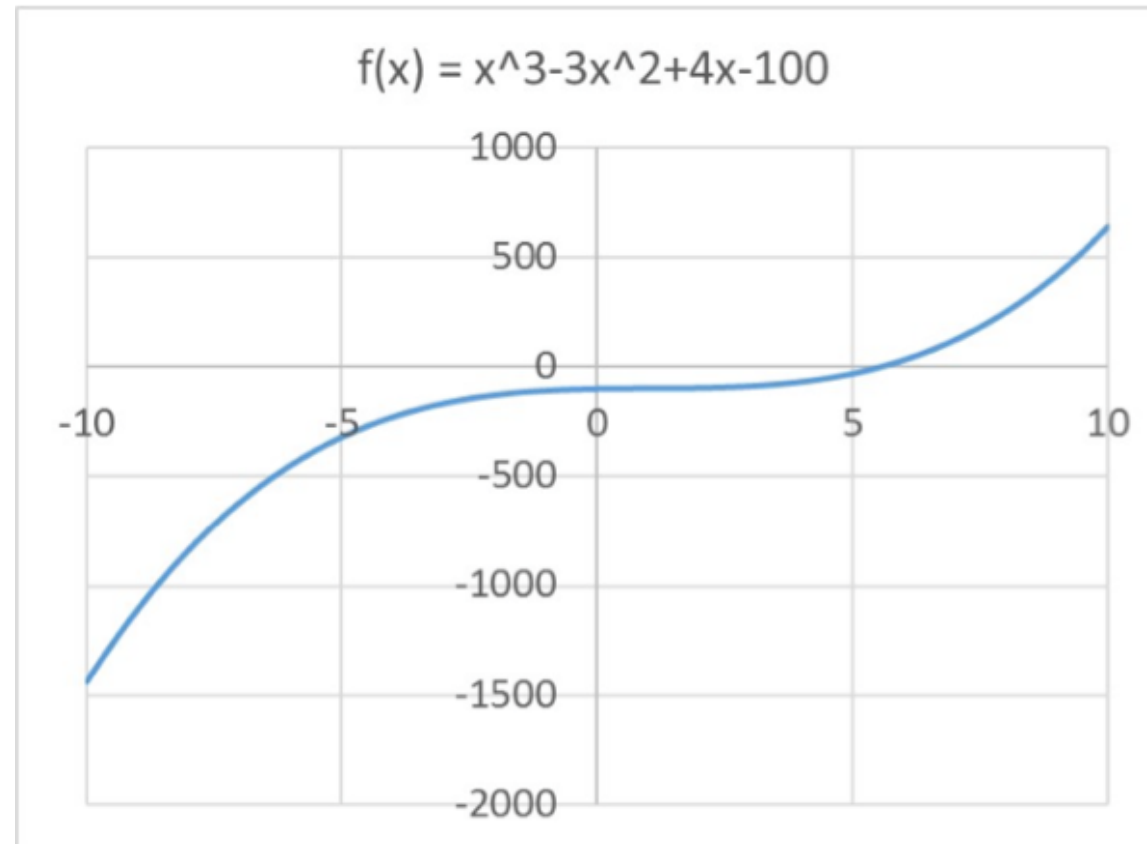
$$f(x) = x^2 - x + 3$$

☐ Not Convex☒ Convex 

You have used 1 of 1 submissions

PART E

(1/1 point)



$$f(x) = x^3 - 3x^2 + 4x - 100$$

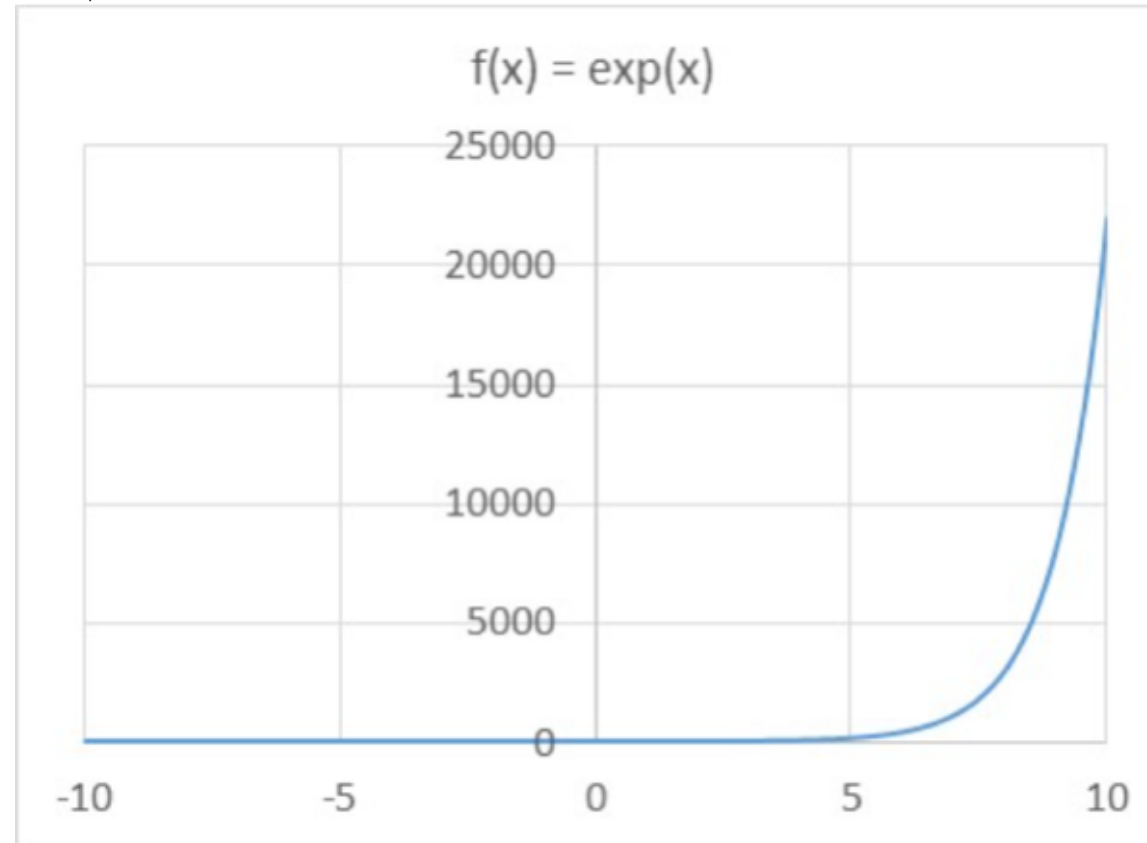
☒ Not Convex ✓

☐ Convex

You have used 1 of 1 submissions

PART F

(1/1 point)



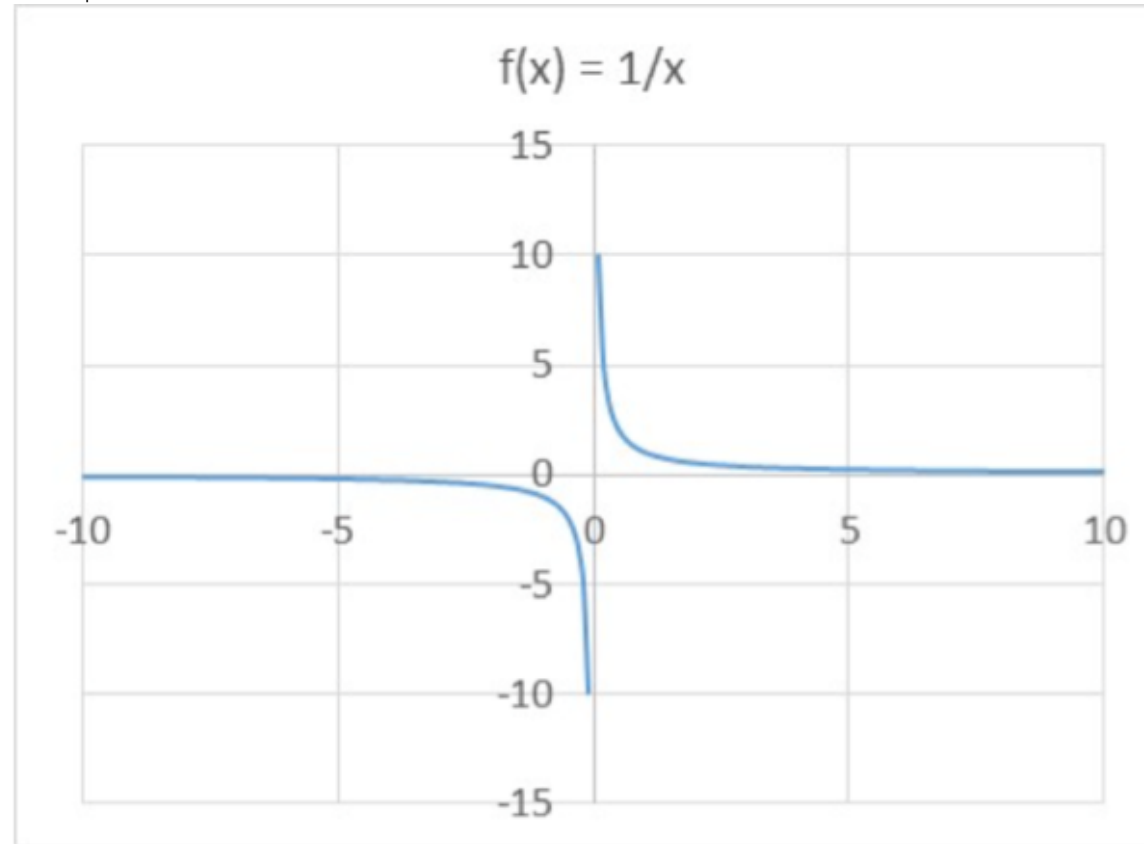
$$f(x) = e^x$$

☐ Not Convex☒ Convex ✓

You have used 1 of 1 submissions

PART G

(1/1 point)



$$f(x) = \frac{1}{x}$$

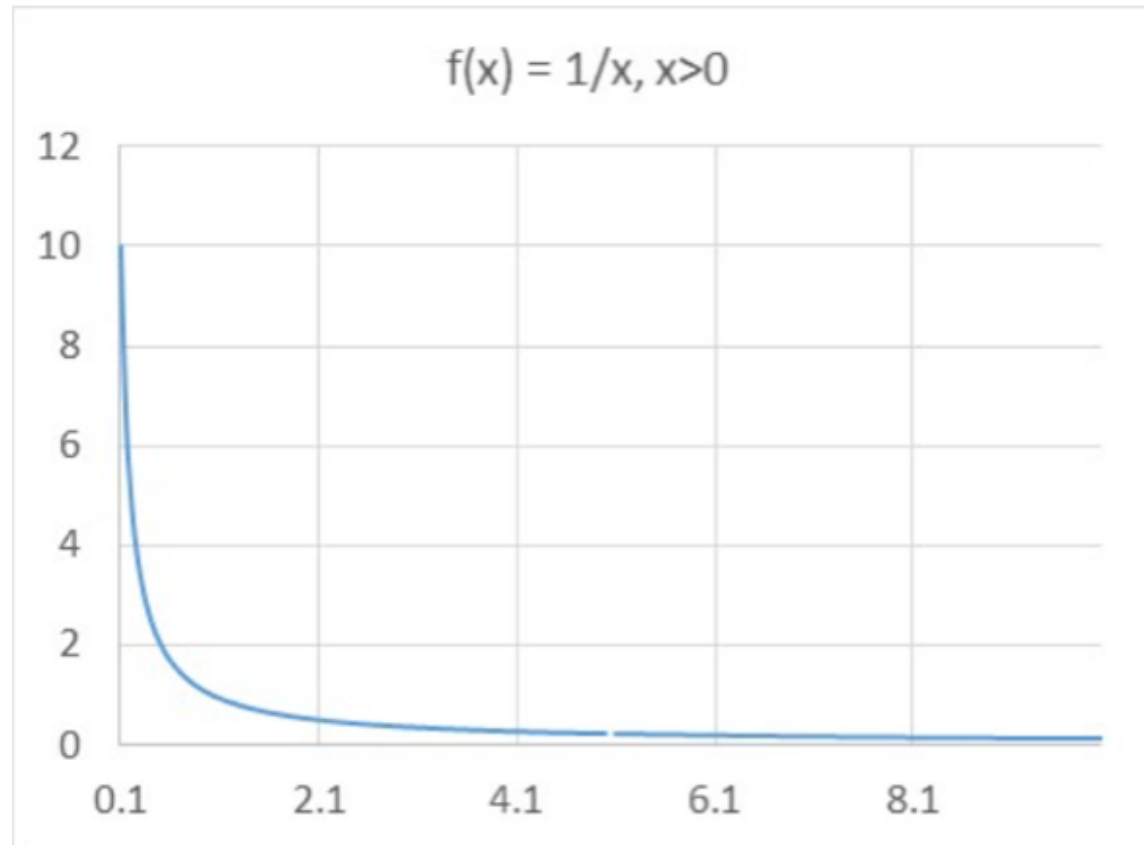
☒ Not Convex 

☐ Convex

You have used 1 of 1 submissions

PART H

(1/1 point)



$f(x) = \frac{1}{x}$ for $x > 0$

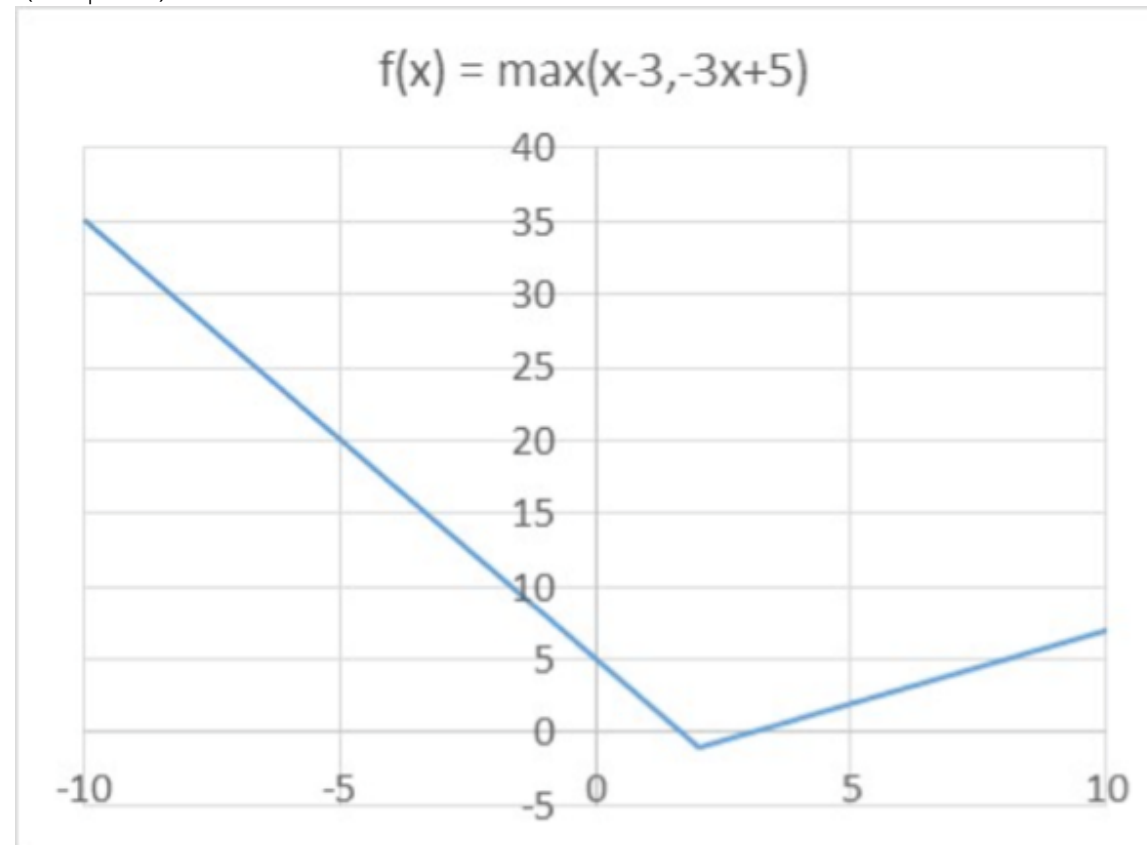
☐ Not Convex

☒ Convex ✓

You have used 1 of 1 submissions

PART I

(1/1 point)



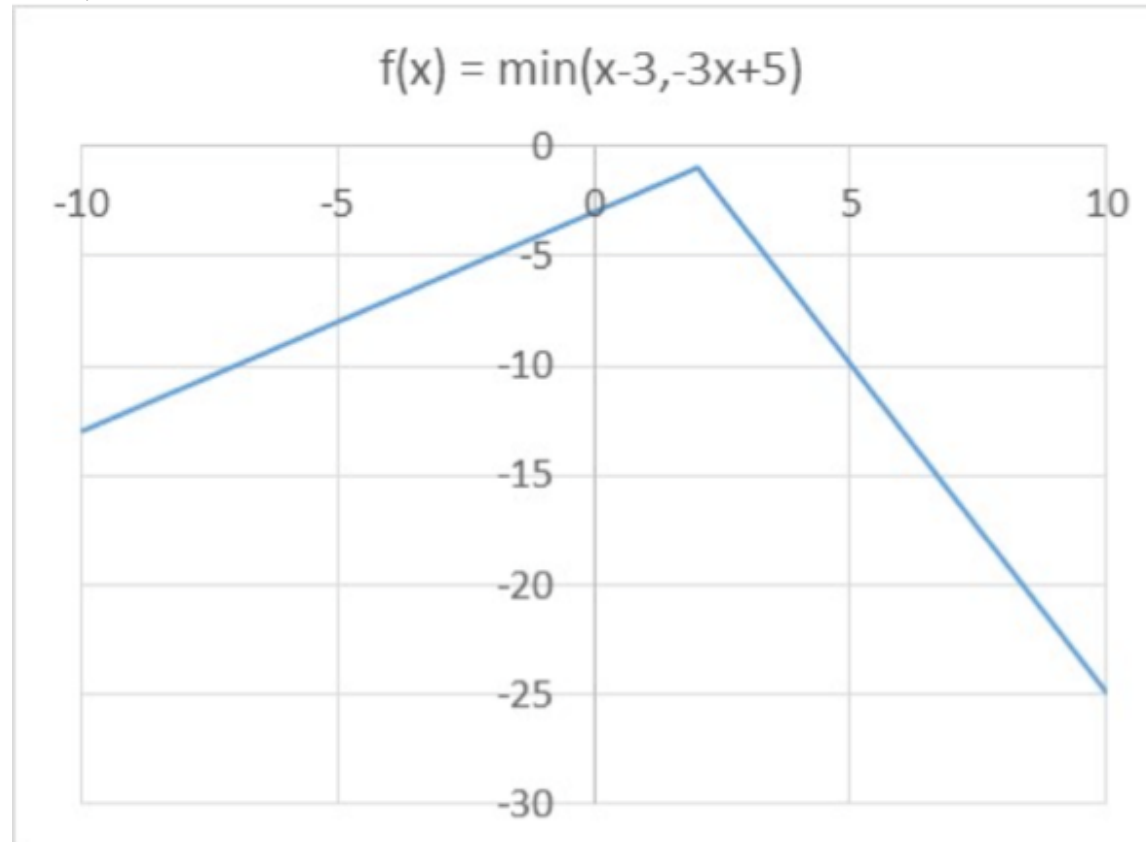
$$f(x) = \max\{x - 3, -3x + 5\}$$

☐ Not Convex☒ Convex ✓

You have used 1 of 1 submissions

PART J

(1/1 point)



$$f(x) = \min\{x - 3, -3x + 5\}$$

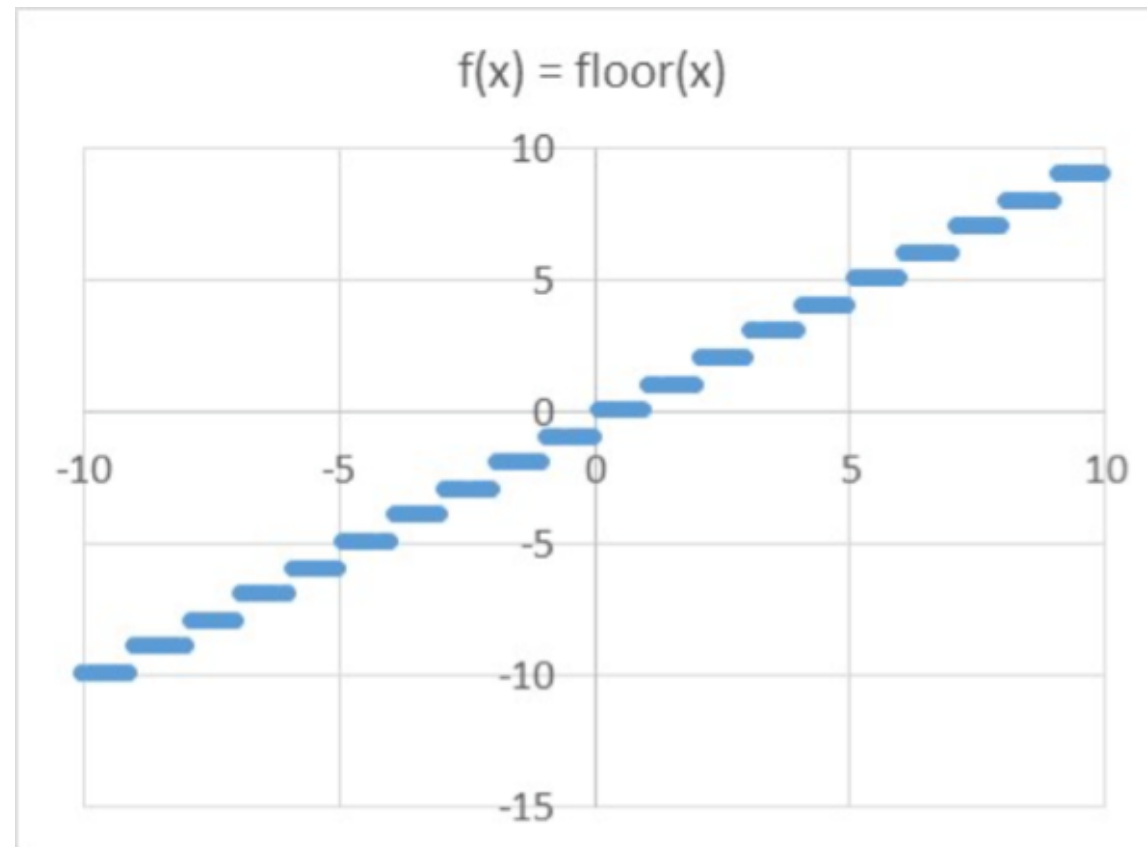
☒ Not Convex 

☐ Convex

You have used 1 of 1 submissions

PART K

(1/1 point)



$f(x) = \lfloor x \rfloor$, which is the largest integer not greater than x

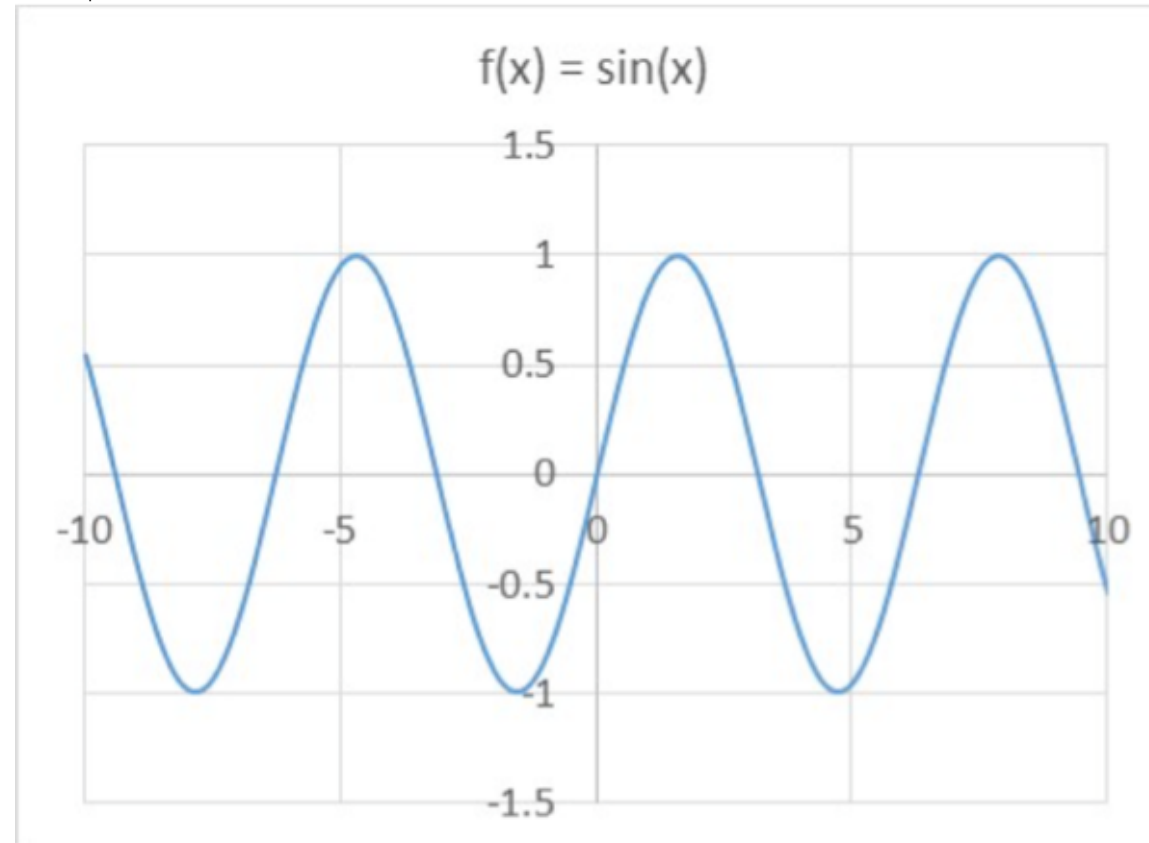
☒ Not Convex ✓

☐ Convex

You have used 1 of 1 submissions

PART L

(1/1 point)



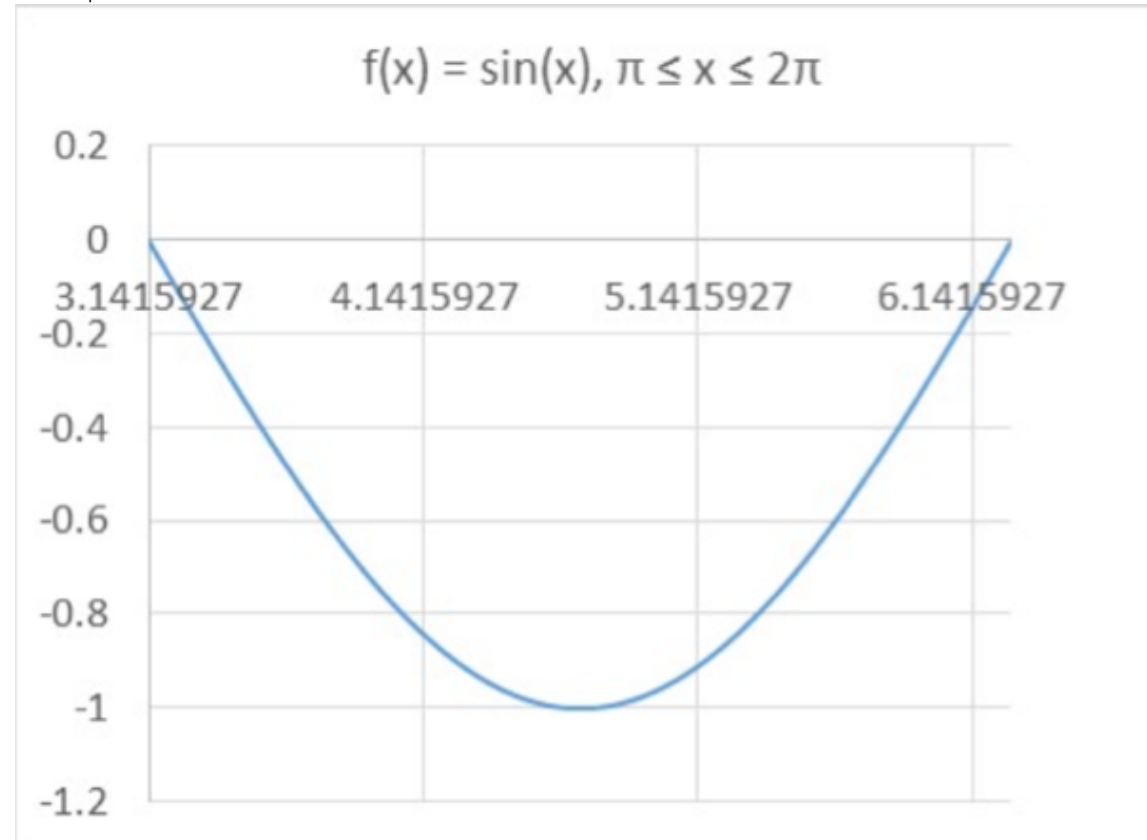
$$f(x) = \sin(x)$$

☒ Not Convex ✓☐ Convex

You have used 1 of 1 submissions

PART M

(1/1 point)



$$f(x) = \sin(x), \pi \leq x \leq 2\pi$$

☐ Not Convex☒ Convex ✓

You have used 1 of 1 submissions

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