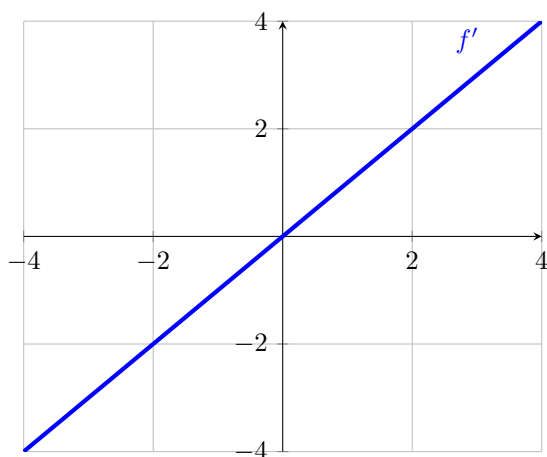


Lecture 20: Graphical Interpretation of the Derivative

Goal: Recover information about a function f from the graph of f' .

1 Inc/Dec

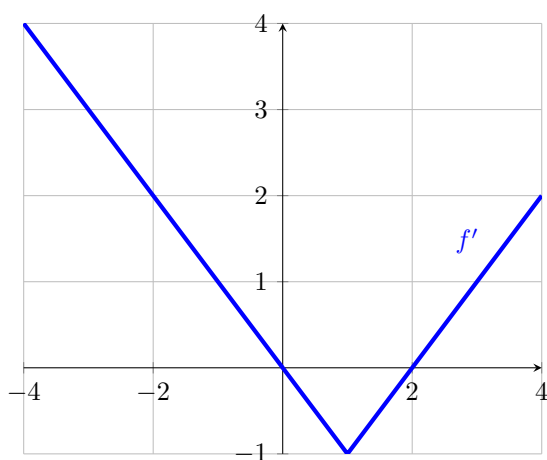
Problem 1. Use the graph of f' to determine the following about f :



(a) Intervals of increase/decrease

(b) Positions of relative max/mins

Problem 2. Use the graph of f' to determine the following about f :

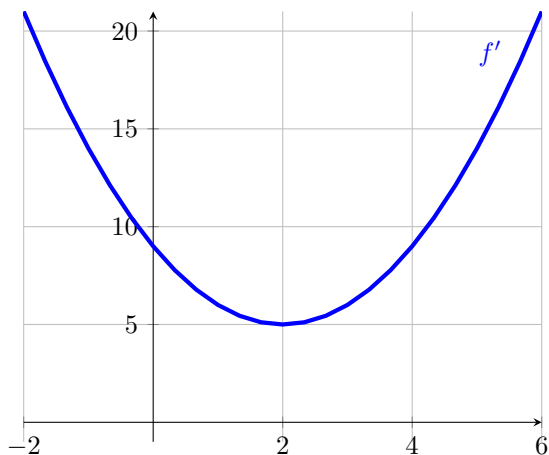


(a) Intervals of increase/decrease

(b) Positions of relative max/mins

2 Concavity

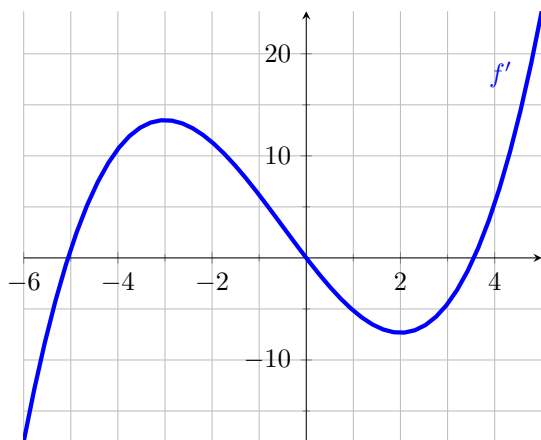
Problem 3. Use the graph of f' to determine the following about f :



(a) When f is concave up VS. concave down

(b) Position of any inflection points

Problem 4. Use the graph of f' to determine the following about f :

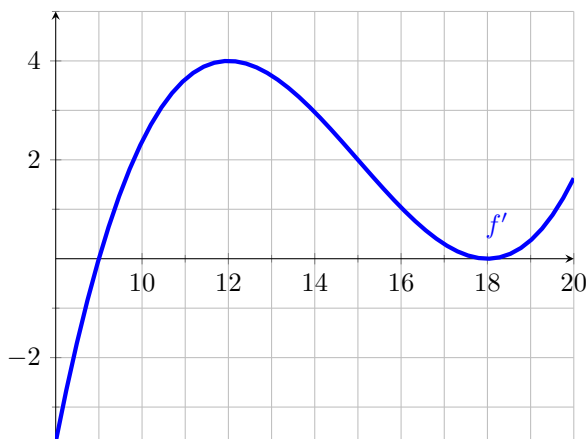


(a) When f is concave up VS. concave down

(b) Position of any inflection points

3 Putting Everything Together

Problem 5. Use the graph of f' to determine the following about f :

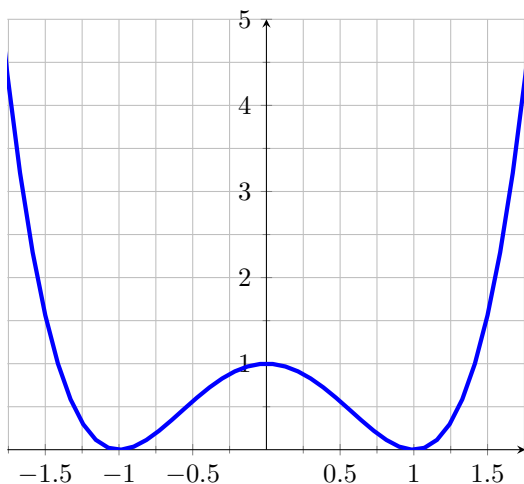


(a) Intervals of Increase/Decrease

(b) When f is concave up VS concave down

(c) State the locations of any relative max/mins as well as inflection points

Problem 6. Use the graph of f' to determine the following about f :



(a) Intervals of Increase/Decrease

(b) When f is concave up VS concave down

(c) State the locations of any relative max/mins as well as inflection points

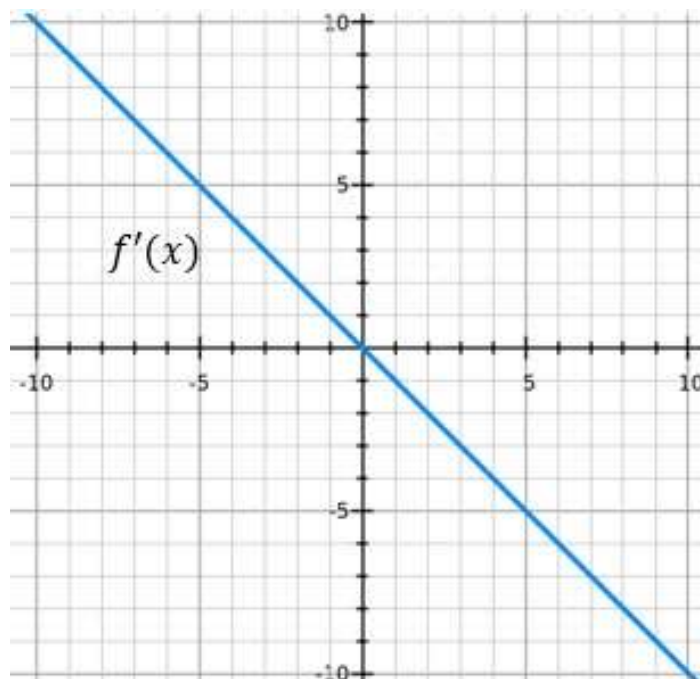
Question 1 of 7

Consider the graph of $f'(x)$, which represents the derivative of the function $f(x)$.

Answer the following questions regarding $f(x)$.

For (a.), (d.), (e.), and (h.), if there is more than one answer for a specific question, separate each answer from the following one using a comma. For (b.), (c.), (f.), and (g.), if there is more than one interval in an answer, separate each interval from the next by typing UNION to enter the \cup symbol.

For any part, if no answer exists at all, enter NO SOLUTION.



(a.) Critical Number(s) =

(b.) Increasing Interval(s):

(c.) Decreasing Interval(s):

(d.) Relative Maxima Occur at $x =$

(e.) Relative Minima Occur at $x =$

(f.) Concave Up Interval(s):

(g.) Concave Down Interval(s):

(h.) Inflection Points Occur at $x =$

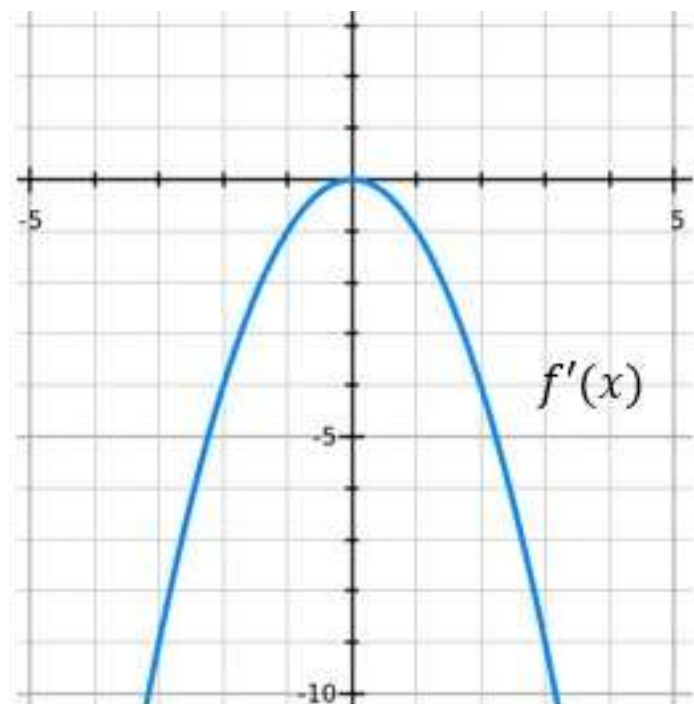
Question 2 of 7

Consider the graph of $f'(x)$, which represents the derivative of the function $f(x)$.

Answer the following questions regarding $f(x)$.

For (a.), (d.), (e.), and (h.), if there is more than one answer for a specific question, separate each answer from the following one using a comma. For (b.), (c.), (f.), and (g.), if there is more than one interval in an answer, separate each interval from the next by typing UNION to enter the \cup symbol.

For any part, if no answer exists at all, enter NO SOLUTION.



(a.) Critical Number(s) =

(b.) Increasing Interval(s):

(c.) Decreasing Interval(s):

(d.) Relative Maxima Occur at $x =$

(e.) Relative Minima Occur at $x =$

(f.) Concave Up Interval(s):

(g.) Concave Down Interval(s):

(h.) Inflection Points Occur at $x =$

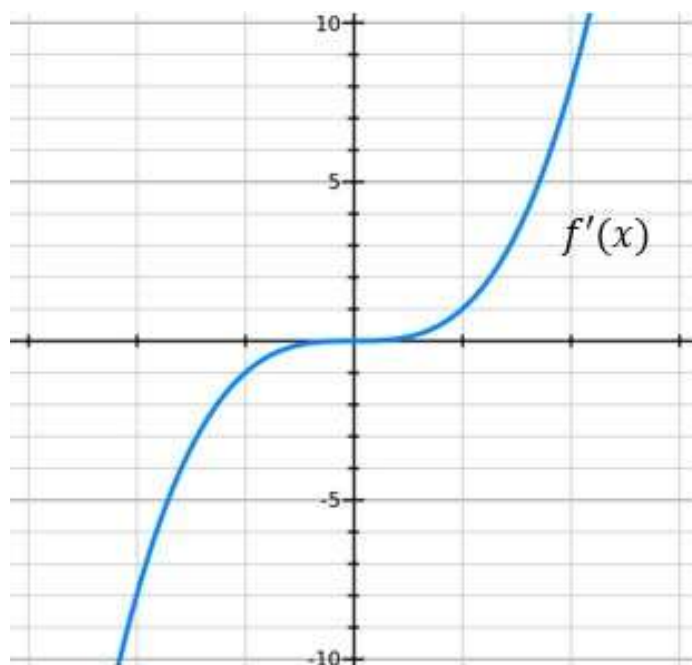
Question 3 of 7

Consider the graph of $f'(x)$, which represents the derivative of the function $f(x)$.

Answer the following questions regarding $f(x)$.

For (a.), (d.), (e.), and (h.), if there is more than one answer for a specific question, separate each answer from the following one using a comma. For (b.), (c.), (f.), and (g.), if there is more than one interval in an answer, separate each interval from the next by typing UNION to enter the \cup symbol.

For any part, if no answer exists at all, enter NO SOLUTION.



(a.) Critical Number(s) =

(b.) Increasing Interval(s):

(c.) Decreasing Interval(s):

(d.) Relative Maxima Occur at $x =$

(e.) Relative Minima Occur at $x =$

(f.) Concave Up Interval(s):

(g.) Concave Down Interval(s):

(h.) Inflection Points Occur at $x =$

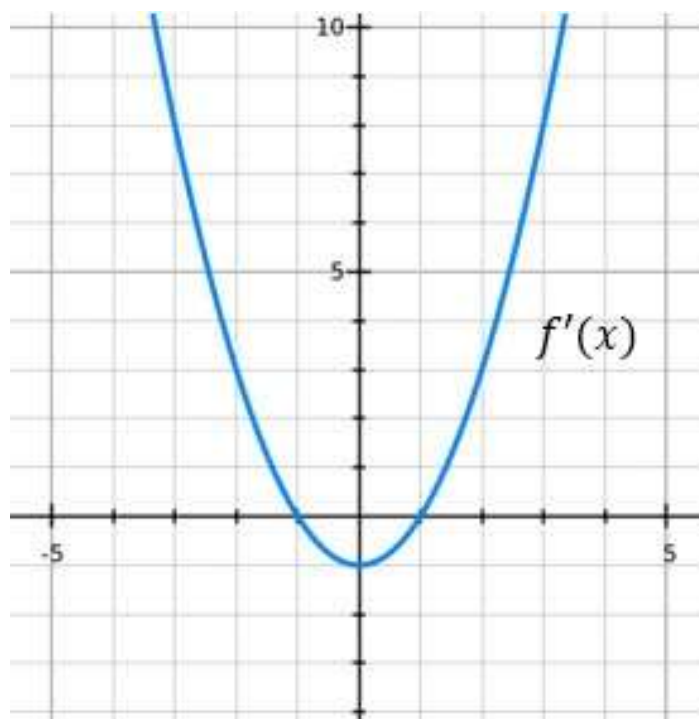
Question 4 of 7

Consider the graph of $f'(x)$, which represents the derivative of the function $f(x)$.

Answer the following questions regarding $f(x)$.

For (a.), (d.), (e.), and (h.), if there is more than one answer for a specific question, separate each answer from the following one using a comma. For (b.), (c.), (f.), and (g.), if there is more than one interval in an answer, separate each interval from the next by typing UNION to enter the \cup symbol.

For any part, if no answer exists at all, enter NO SOLUTION.



(a.) Critical Number(s) =

(b.) Increasing Interval(s):

(c.) Decreasing Interval(s):

(d.) Relative Maxima Occur at $x =$

(e.) Relative Minima Occur at $x =$

(f.) Concave Up Interval(s):

(g.) Concave Down Interval(s):

(h.) Inflection Points Occur at $x =$

Question 5 of 7

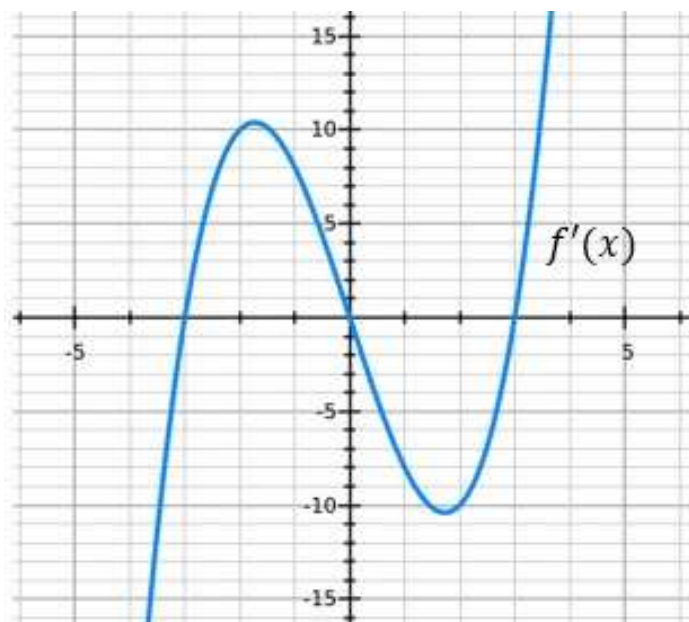
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Consider the graph of $f'(x)$, which represents the derivative of the function $f(x)$.

Answer the following questions regarding $f(x)$.

For (a.), (d.), and (e.), if there is more than one answer for a specific question, separate each answer from the following one using a comma. For (b.) and (c.), if there is more than one interval in an answer, separate each interval from the next by typing UNION to enter the \cup symbol.

For any part, if no answer exists at all, enter NO SOLUTION.



(a.) Critical Number(s) =

(b.) Increasing Interval(s):

(c.) Decreasing Interval(s):

(d.) Relative Maxima Occur at $x =$

(e.) Relative Minima Occur at $x =$

Question 6 of 7

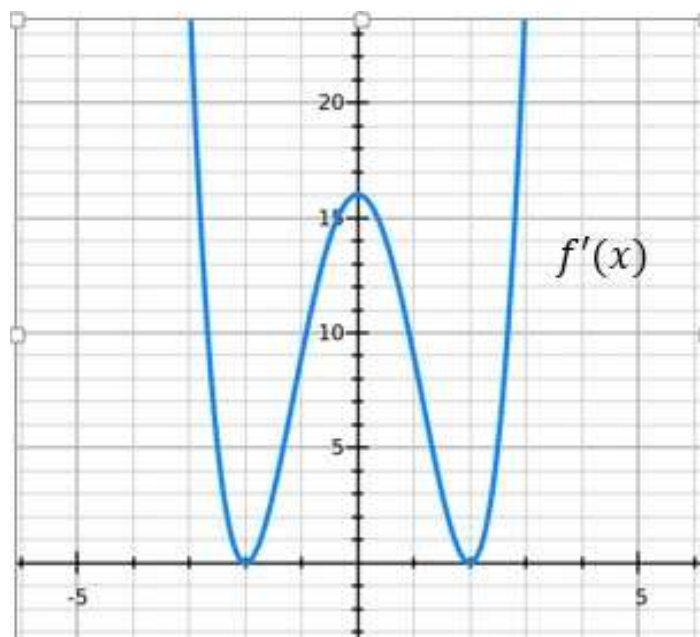
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Consider the graph of $f'(x)$, which represents the derivative of the function $f(x)$.

Answer the following questions regarding $f(x)$.

For (a.), (d.), (e.), and (h.), if there is more than one answer for a specific question, separate each answer from the following one using a comma. For (b.), (c.), (f.), and (g.), if there is more than one interval in an answer, separate each interval from the next by typing UNION to enter the \cup symbol.

For any part, if no answer exists at all, enter NO SOLUTION.



(a.) Critical Number(s) =

(b.) Increasing Interval(s):

(c.) Decreasing Interval(s):

(d.) Relative Maxima Occur at $x =$

(e.) Relative Minima Occur at $x =$

(f.) Concave Up Interval(s):

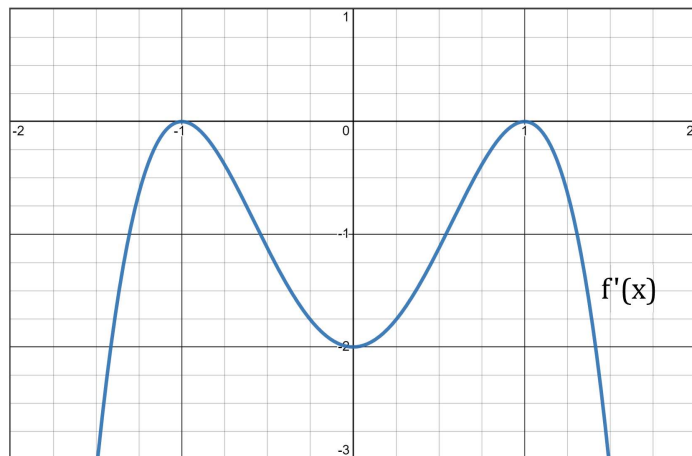
(g.) Concave Down Interval(s):

(h.) Inflection Points Occur at $x =$

Question 7 of 7

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The following graph shows the derivative $f'(x)$ of the function $f(x)$.



Which of the following statements is true about $f(x)$?

- ☐ $f(x)$ is increasing on $(-\infty, -1)$ and $(0, 1)$.
- ☐ $f(x)$ is concave up on $(-1, 1)$.
- ☐ $f(x)$ has one relative minimum.
- ☐ $f(x)$ has two relative maxima.
- ☐ $f(x)$ has one critical number.
- ☐ $f(x)$ has three inflection points.