This is graphing assignment. You must create graphs on your own paper.

Get feedback!

All problems are limited submission.

Many problems have penalties for each incorrect submission

Most problems are set to immediately display the correct answer if you use up your submissions. On graphing problems you can use this feature to compare your graph to the solution.

Instructions

Read today's Notes and Learning Goals
Suppose \( f(x) \) is a function such that

- \( f(3) = 4 \)
- \( f'(x) > 0 \) on the interval \((-\infty, \infty)\). I.e., the derivative is always positive.

Which of the following is a possible graph of \( f(x) \)?
Many different functions meet the conditions

- $f(3) = 4$
- $f'(x) > 0$ on the interval $(-\infty, \infty)$. i.e., the derivative is always positive.

Several possible graphs are shown below. Which of them meet the above conditions? Select all that apply.
Many different functions meet the conditions

- $f(3) = 4$
- $f'(x) > 0$ on the interval $(-\infty, \infty)$. I.e., the derivative is always positive.

However, all of them have two features in common. Which of the following are common features for all functions that meet the above conditions? Select all that apply.

- [ ] $f$ passes through the point $(3, 4)$.
- [ ] $f$ passes through the point $(4, 3)$.
- [ ] $f$ is increasing.
- [ ] $f$ is decreasing.
Suppose \( f(x) \) is a function such that

- \( f(0) = -1 \)
- The domain of \( f \) is \([-1, 1]\).
- \( f'(x) < 0 \) on its domain.

Which of the following is a possible graph of \( f(x) \)?
Suppose \( f(x) \) is a function such that

- \( f(0) = 2 \)
- The domain of \( f \) is \([0,10]\).
- \( f'(x) > 0 \) on the interval \((0,5)\).
- \( f'(x) < 0 \) on the interval \((5,10)\).

On your own graph paper make a possible sketch of the function \( f(x) \).

It is not possible for WebAssign to check your graph, so get feedback. Then answer the following question about your graph.

**Note:** Only 6 submissions allowed, but **you lose a half point** per submission.

Which of the following statements are true about the function \( f \)?
Select all that apply.

- \( f \) passes through the point \((0,2)\).
- \( f \) passes through the point \((2,0)\).
- \( f \) is increasing on the interval \((0,5)\).
- \( f \) is increasing on the interval \((5,10)\).
- \( f \) is decreasing on the interval \((0,5)\).
- \( f \) is decreasing on the interval \((5,10)\).
- The slope of \( f \) is 2

Keep your graph you created. You will need it on the next problem and may be asked to hand it in for feedback.
In the previous problem you created a graph for the function $f(x)$ such that

- $f(0) = 2$
- The domain of $f$ is $[0,10]$.
- $f'(x) > 0$ on the interval $(0,5)$.
- $f'(x) < 0$ on the interval $(5,10)$.

Use your graph to answer the following questions. **You get only two attempts** at each question. Be sure you get feedback on your graph first.

1. List all locations where $f$ has a local maximum. Enter your answers as a comma separated list. Do not include endpoints. If there are no local maxima, enter DNE.

   Local Maximum at $x =$

2. List all locations where $f$ has a local minimum. Enter your answers as a comma separated list. Do not include endpoints. If there are no local minima, enter DNE.

   Local Minimum at $x =$

Keep your graph you created, you may be asked to hand it in for feedback.
Suppose \( f(x) \) is a function such that

- \( f(2) = 4 \)
- The domain of \( f \) is \([-5, 5]\).
- The graph of \( f' \) is

On your own graph paper make a possible sketch of the function \( f(x) \).

It is not possible for webassign to check your graph, so get feedback. Then answer the following question about your graph.

**Note:** Only 6 submissions allowed, but you lose a half point per submission.

Which of the following statements is true about the function \( f \)? Select all that apply.
☐ $f$ passes through the point $(2,0)$.
☐ $f$ passes through the point $(2,4)$.
☐ $f$ is increasing on the interval $(-5,2)$.
☐ $f$ is decreasing on the interval $(2,5)$.
☐ $f$ is decreasing on the interval $(-5,5)$.
☐ At the point $x = 3$, the slope of $f$ is $-1$.
☐ The slope of $f$ is $-1$.

Keep your graph you created. You will need it on the next problem and may be asked to hand it in for feedback.
In the previous problem you created a graph for the function $f(x)$ such that

- $f(2) = 4$
- The domain of $f$ is $[-5,5]$.
- The graph of $f'$ is

Use your graph to answer the following question. **You get only two attempts** at each question. Be sure you get feedback on your graph first.

1. List all locations where $f$ has a local maximum. Enter your answers as a comma separated list. Do not include endpoints. If there are no local maxima, enter DNE.

   Local Maximum at $x =$
2. List all locations where $f$ has a local minimum. Enter your answers as a comma separated list. Do not include endpoints. If there are no local minima, enter DNE.

Local Minimum at $x =$
Suppose \( f(x) \) is a function such that

- \( f(1) = 2 \)
- The domain of \( f \) is \((-\infty, \infty)\).
- The graph of \( f' \) is

On your own graph paper make a possible sketch of the function \( f(x) \).

It is not possible for WebAssign to check your graph, so get feedback. Then answer the following question about your graph.

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Which of the following statements are true about the function \( f \)? Select all that apply.
☐ $f$ passes through the point $(5,0)$.

☐ $f$ is decreasing on the interval $(2.5,\infty)$.

☐ The slope of $f$ is zero at the point $x = 2.5$.

☐ $f$ is decreasing on the interval $(-\infty,0)$.

☐ The slope of $f$ is zero at the point $x = 5$.

☐ $f$ is increasing on the interval $(-\infty,2.5)$.

☐ $f$ is increasing on the interval $(0,5)$.

Keep the graph you created. You will need it on the next problem and may be asked to hand it in for feedback.
In the previous problem you created a graph for the function $f(x)$ such that

- $f(1) = 2$
- The domain of $f$ is $(-\infty, \infty)$.
- The graph of $f'$ is

![Graph of $f'(x)$](image)

Use your graph to answer the following question. **You get only two attempts** at each question. Be sure you get feedback on your graph first.

1. List all locations where $f$ has a local maximum. Enter your answers as a comma separated list. Do not include endpoints. If there are no local maxima, enter DNE.

   Local Maximum at $x =$ 

2. List all locations where $f$ has a local minimum. Enter your answers as a comma separated list. Do not include endpoints. If there are no local minima, enter DNE.

Local Minimum at $x =$
Suppose \( f(x) \) is a function such that

- \( f(1) = 3 \)
- The domain of \( f \) is \([-3, 3]\).
- The graph of \( f' \) is

\[
\frac{df}{dx}
\]

On your own graph paper make a possible sketch of the function \( f(x) \).

It is not possible for WebAssign to check your graph, so get feedback. Then answer the following question about your graph.

**Note:** Only 6 submissions allowed, but you lose a half point per submission.

Which of the following statements are true about the function \( f \)?
Select all that apply.
☐ $f$ passes through the point $(0.5, 0.1)$.

☐ $f$ is increasing on the interval $(-3, 3)$.

☐ At the point $x = 0.5$, the slope of $f$ is 0.

☐ $f$ is sometimes increasing and sometimes decreasing.

☐ $f$ passes through the point $(1, 3)$.

☐ $f$ is decreasing on the interval $(-3, 0.5)$

☐ At the point $x = 0.5$, the slope of $f$ is 0.1.

Keep your graph you created. You will need it on the next problem and may be asked to hand it in for feedback.
In the previous problem you created a graph for the function \( f(x) \) such that

- \( f(1) = 3 \)
- The domain of \( f \) is \([-3,3]\).
- The graph of \( f' \) is

Use your graph to answer the following question. **You get only two attempts** at each question. Be sure you get feedback on your graph first.

1. List all locations where \( f \) has a local maximum. Enter your answers as a comma separated list. Do not include endpoints. If there are no local maxima, enter DNE.

   Local Maximum at \( x = \)
2. List all locations where \( f \) has a local minimum. Enter your answers as a comma separated list. Do not include endpoints. If there are no local minima, enter DNE.

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<th>Local Minimum at ( x = )</th>
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