1. (1 pt) Suppose that

$$f(x) = \frac{6}{x^2 - 9}.$$

(A) List all critical numbers of f. If there are no critical numbers, enter 'NONE'.
Critical numbers = _____

(B) Use interval notation to indicate where $f(x)$ is increasing.
Note: Use 'INF' for ∞, '-INF' for $-\infty$, and use 'U' for the union symbol.

Increasing: _____

(C) Use interval notation to indicate where $f(x)$ is decreasing.
Decreasing: _____

(D)List the x-coordinates of all local maxima of f. If there are no local maxima, enter 'NONE'.
x values of local maxima = _____

(E) List the x-coordinates of all local minima of f. If there are no local minima, enter 'NONE'.
x values of local minima = _____

(F) Use interval notation to indicate where $f(x)$ is concave up.
Concave up: _____

(G) Use interval notation to indicate where $f(x)$ is concave down.
Concave down: _____

(H) List the x values all inflection points of f. If there are no inflection points, enter 'NONE'.
Inflection points = _____

(I) List all horizontal asymptotes of f. If there are no horizontal asymptotes, enter 'NONE'.
Horizontal asymptotes $y =$ _____

(J) List all vertical asymptotes of f. If there are no vertical asymptotes, enter 'NONE'.
Vertical asymptotes $x =$ _____

(K) Use all of the preceding information to sketch a graph of f. When you're finished, enter a "1" in the box below.
Graph Complete: _____

Answer(s) submitted:

- 0
- (-INF,-3) U (-3, 0)
- (0,3) U (3, INF)
- 0
- NONE
- (-INF,-3) U (3,INF)
- (-3,3)
- NONE
- 0
- -3,3
- 1

(correct)
Correct Answers:

- 0
- (-infinity,-3) U (-3,0)
- (0,3) U (3,infinity)
- 0
- NONE
- (-infinity,-3) U (3,infinity)
- (-3,3)
- NONE
- 0
- -3, 3
- 1

2. (1 pt) Suppose that

$$f(x) = 8x - 3\ln(x), \quad x > 0.$$

(A) List all critical numbers of f . If there are no critical values, enter 'NONE'.
Critical numbers = _____

(B) Use interval notation to indicate where $f(x)$ is increasing.
Note: Use 'INF' for ∞, '-INF' for $-\infty$, and use 'U' for the union symbol.

Increasing: _____

(C) Use interval notation to indicate where $f(x)$ is decreasing.
Decreasing: _____

(D) List the x-coordinates of all local maxima of f. If there are no local maxima, enter 'NONE'.
x values of local maxima = _____

(E) List the x-coordinates of all local minima of f. If there are no local minima, enter 'NONE'.
x values of local minima = _____

(F) Use interval notation to indicate where $f(x)$ is concave up.
Concave up: _____

(G) List the x values of all inflection points of f. If there are no inflection points, enter 'NONE'.
x values of inflection points = _____

(H) Use all of the preceding information to sketch a graph of f. When you're finished, enter a "1" in the box below.

Graph Complete: _____

Answer(s) submitted:

- 3/8
- (3/8,INF)
- (0,3/8)
- NONE
- 3/8
- (0,inf)
- NONE
- 1

(correct)

Correct Answers:

- 0.375
- (0.375,infinity)
- (0,0.375)
- NONE
- 0.375
- (0,infinity)
- NONE
- 1

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3. (1 pt) Suppose that

$$f(x) = 3x^6 - 7x^5.$$

(A) Find all critical numbers of f. If there are no critical numbers, enter 'NONE'.
Critical numbers = _____

(B) Use interval notation to indicate where $f(x)$ is increasing.
Note: Use 'INF' for ∞, '-INF' for $-\infty$, and use 'U' for the union symbol.
Increasing: _____

(C) Use interval notation to indicate where $f(x)$ is decreasing.
Decreasing: _____

(D) Find the x-coordinates of all local maxima of f. If there are no local maxima, enter 'NONE'.
x values of local maxima = _____

(E) Find the x-coordinates of all local minima of f. Note: If there are no local minima, enter 'NONE'.
x values of local minima = _____

(F) Use interval notation to indicate where $f(x)$ is concave up.
Concave up: _____

(G) Use interval notation to indicate where $f(x)$ is concave down.
Concave down: _____

(H) List the x values of all inflection points of f. If there are no inflection points, enter 'NONE'.
x values of inflection points = _____

(I) Find all horizontal asymptotes of f. If there are no horizontal asymptotes, enter 'NONE'.
Horizontal asymptotes $y =$ _____

(J) Find all vertical asymptotes of f. If there are no vertical asymptotes, enter 'NONE'.
Vertical asymptotes $x =$ _____

(K) Use all of the preceding information to sketch a graph of f. When you're finished, enter a "1" in the box below.
Graph Complete: _____

Answer(s) submitted:

- 0, (35/18)
- (35/18,INF)
- (-INF,35/18)
- NONE
- 35/18
- (-INF,0) U ((14/9),INF)
- (0,(14/9))
- 0, (14/9)
- NONE
- NONE
- 1

(correct)

Correct Answers:

- 0, 1.94444444444444
- (1.94444444444444,infinity)
- (-infinity,1.94444444444444)
- NONE
- 1.94444444444444
- (-infinity,0) U (1.55555555555556,infinity)
- (0,1.55555555555556)
- 0, 1.55555555555556
- NONE
- NONE
- 1