

Honors PreCalculus '17-18

Name: _____

Dr. Quattrin

Rational Functions Test

CALCULATOR ALLOWED

Score _____

Round to 3 decimal places. Show all work.

1. The equation of the line tangent to the graph of $y = \frac{3x+4}{4x-3}$ at the point (1, 7) is

a) $y = -25x + 32$

b) $y = 31x - 24$

c) $y = 7x$

d) $y = 5x + 12$

e) $y = 25x - 18$

2. $\lim_{x \rightarrow \infty} \frac{(2x-1)(3-x)}{(x-1)(x+3)} =$

a) 3

b) 2

c) -2

d) -3

e) dne

3. Let $f(x)$ and $g(x)$ be differentiable functions. The table below gives the values of $f(x)$ and $g(x)$, and their derivatives, at several values of x .

x	$f(x)$	$g(x)$	$f'(x)$	$g'(x)$
1	3	2	4	-6
2	1	8	-5	7
3	7	-2	7	9

If $h(x) = \frac{f(x)}{g(x)}$, what is the value of $h'(2)$?

- a) -4 b) -63 c) 51 d) $-\frac{47}{64}$ e) $-\frac{33}{64}$
-

4. For $x > 0$, the horizontal line $y = 2$ is an asymptote for the graph of the function f . Which of the following statements must be true?

- a) $f(0) = 2$
- b) $f(0) \neq 2$ for all $x \geq 0$
- c) $f(2)$ is undefined
- d) $\lim_{x \rightarrow 2} f(x) = \infty$
- e) $\lim_{x \rightarrow \infty} f(x) = 2$
-

5. Let f be the function with derivative given by $f'(x) = x^2 - \frac{2}{x}$. On which of the following interval is f decreasing

- a) $(-\infty, -1)$ b) $(-\infty, 0)$ c) $(-1, 0)$
d) $(0, \sqrt[3]{2})$ e) $(\sqrt[3]{2}, \infty)$
-

6. If $y = \frac{2x+3}{3x+2}$, then $\frac{dy}{dx} =$

- a) $\frac{12x+13}{(3x+2)^2}$ b) $\frac{12x-13}{(3x+2)^2}$ c) $\frac{5}{(3x+2)^2}$
d) $\frac{-5}{(3x+2)^2}$ e) $\frac{2}{3}$
-

7. Consider the function $f(x) = \frac{6x}{a+x^3}$, for which $f'(0) = 3$. The value of a is

- a) 5 b) 4 c) 3 d) 2 e) 1
-

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Show all work.

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1. Find asymptotes, POEs, and zeros of $y = \frac{2x^3 - 7x^2 - 14x - 5}{2x^2 - 7x - 4}$. Show the algebraic work to support the zeros.

2. Apply the First Derivative Test to $y = \frac{2x^3 - 7x^2 - 14x - 5}{2x^2 - 7x - 4}$, and Find the extreme points.

3. $\frac{d}{dx} \left[\frac{x^2 - 5x - 6}{x^2 - 4x + 3} \right]$

4. Find the Extreme Points of $y = \frac{8x}{x^2 + 4}$ on $x \in [-4, 1]$. Show the derivative and algebra to support the critical values.

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NO CALCULATOR ALLOWED

Score _____

Show all work.

5. Write an equation of a rational function that has x -intercepts at $(-5, 0)$, VA at $x = 6$, a POE at $x = 2$, and a HA at $y = \frac{3}{7}$.

6. Show the sign pattern and solve $\frac{x^2 - 5x - 6}{x^2 - 4x + 3} > 0$.

7. Find the traits and **sketch** $y = \frac{8x}{x^2 + 4}$ on $x \in [-4, 1]$.

Domain:

Range:

Y – Int:

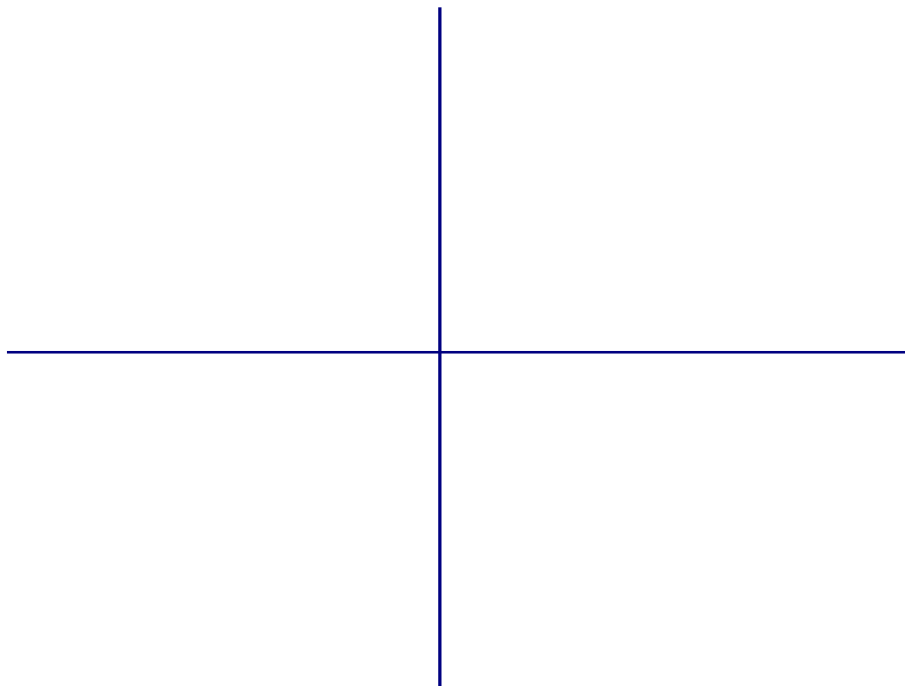
End Behavior:

Vas:

POEs:

Zeros:

Extreme Values:



8. Find the traits and **sketch** of $y = \frac{2x^3 - 7x^2 - 14x - 5}{2x^2 - 7x - 4}$.

Domain:

Range:

Y – Int:

End Behavior:

Zeros:

Extreme Values:

POEs:

VAs:

