

Round to 3 decimal places. Show all work.

1. The equation of the line tangent to the graph of $y = \frac{x}{2x-3}$ at the point $(1, f(1))$ is

- (a) $3x + y = 4$ (b) $3x + y = 2$ (c) $x - 3y = -2$
(d) $x - 3y = 4$ (e) $x + 3y = 2$
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2. A function is defined as $g(x) = \frac{(x-3)^2}{x-7}$. Which of the following is **false**?

- (a) $g(x)$ is increasing for $x > 11$.
(b) $g(x)$ is decreasing on $[3, 11]$.
(c) $g(x)$ has a local maximum at $x = 3$.
(d) $g(x)$ has a horizontal asymptote at $y = 0$.
(e) $g(x)$ has a vertical asymptote at $x = 7$.
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5. A particle moves along the x -axis at that its position at any time is given by $x(t) = \frac{1-t}{1+t}$. The acceleration of the particle at $t = 0$ is

- a) -4 b) -2 c) $-\frac{3}{5}$ d) 2 e) 4
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6. If $y = \frac{3-2x}{3x+2}$, then $\frac{dy}{dx} =$

- a) $\frac{12x+2}{(3x+2)^2}$ b) $\frac{12x-2}{(3x+2)^2}$ c) $\frac{13}{(3x+2)^2}$
d) $\frac{-13}{(3x+2)^2}$ e) $-\frac{2}{3}$
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7. $\lim_{x \rightarrow \infty} \frac{16-x^2}{x^2+9} =$

- a) 0 b) -1 c) 2 d) $\frac{16}{9}$ e) ∞
-

Honors PreCalculus'16-17

Name: _____

Dr. Quattrin

Rational Functions Test -- CALCULATOR ALLOWED

Round to 3 decimal places.

Score _____

Show all work.

1. Find asymptotes, POEs, and zeros of $y = \frac{3x^3 - 8x^2 - 20x + 16}{3x^2 + 7x - 6}$. Show the algebraic work to support the zeros.

2. Find the extreme points of $y = \frac{3x^3 - 8x^2 - 20x + 16}{3x^2 + 7x - 6}$ graphically, but show the algebraic work to support the critical values.

3. $\frac{d}{dx} \left[\frac{x^2 - 4x - 12}{x^2 + 3x - 10} \right]$

4. Find the Extreme Points of $y = \frac{16 - x^2}{x^2 + 9}$ on $x \in [-4, 4]$. Show the derivative and algebra to support the critical values.

Dr. Quattrin

Rational Functions Test – NO CALCULATOR ALLOWED

Show all work.

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

6. Show the sign pattern and solve $\frac{x^2 - 4x - 12}{x^2 + 3x - 10} \leq 0$.

7. Find the traits and **sketch** $y = \frac{16 - x^2}{x^2 + 9}$ on $x \in [-4, 4]$.

Domain:

Range:

Y – Int:

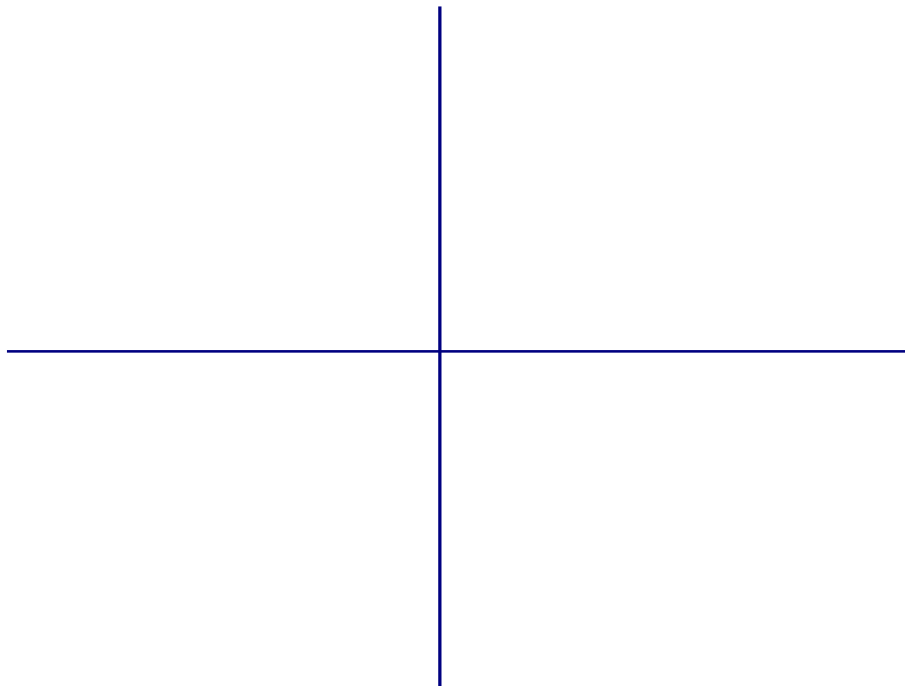
End Behavior:

Vas:

POEs:

Zeros:

Extreme Values:



8. Find the traits and **sketch** of $y = \frac{3x^3 - 8x^2 - 20x + 16}{3x^2 + 7x - 6}$.

Domain:

Range:

Y-Int:

End Behavior:

Zeros:

Extreme Values:

POEs:

VAs:

