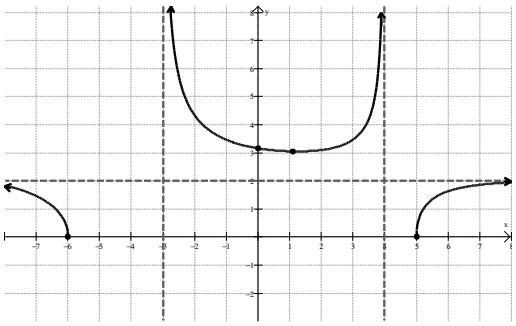
PreCalculus Honors '17-18 Name:_____
Dr. Quattrin
Radical Functions Test
CALCULATOR ALLOWED Score _____
Round to 3 decimal places. Show all work.



1. Which of the following sign patterns apply to the graph above?

I. y : $+ \quad 0 \quad - \quad \text{DNE} \quad + \quad \text{DNE} \quad - \quad 0 \quad +$ over x : $-6 \quad -3 \quad 4 \quad 5$

II. y^2 : $+ \quad 0 \quad - \quad \text{DNE} \quad + \quad \text{DNE} \quad - \quad 0 \quad +$ over x : $-6 \quad -3 \quad 4 \quad 5$

III. $\frac{dy}{dx}$: $- \quad \text{DNE} \quad \text{DNE} \quad - \quad 0 \quad + \quad \text{DNE} \quad \text{DNE} \quad +$ over x : $-6 \quad -3 \quad 1 \quad 4 \quad 5$

a) I only b) II only c) I and II only

d) II and III only e) I, II, and III

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2. At what approximate rate (in cubic meters per minute) is the volume of a sphere changing at the instant when the surface area is 2 square meters and the radius is increasing at the rate of 1/3 meters per minute?

a) 0.667 b) 1.080 c) 0.700 d) 2.128 e) 1.714

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3. The absolute minimum of $y = \sqrt{25 - x^2}$ on $x \in [-2, 4]$ is

a) -2 b) 0 c) 5 d) $\sqrt{21}$ e) 3

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4. Use Implicit Differentiation to find the points on $x^3 - y^2 + x^2 - 1 = 0$ which have horizontal tangent lines.

a) $(0, \pm 1)$

b) $(-1.5, 0)$ only

c) $\left(-\frac{2}{3}, \pm 1.072\right)$ only

d) $(0, \pm 1)$ and $\left(-\frac{2}{3}, \pm 1.072\right)$

e) The tangent line is never horizontal

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5. Let $f(x)$ be the function with $f(1) = 2$ and $f'(x) = \sqrt{x^2 + 3}$. Using the tangent line approximation to the graph of $f(x)$ at x=1, estimate $f(0.98)$.

a. 1.99 b. 1.98 c. 1.97 d. 1.96 e. 1.95

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6. Given the functions $f(x)$ and $g(x)$ that are both continuous and differentiable, and that have values given on the table below.

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
2	4	-2	8	1
4	10	8	4	3
8	6	-12	2	4

Given that $h(x)=f\left(g(x)\right)$, $h'(2)=$

a) -16 b) -12 c) -1 d) 2 e) 10

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7. Find the absolute maximum value of $y=\sqrt{36-x^2}$ on the interval $x\in[-2,\ 2]$.

a) -2 b) 0 c) 2 d) $4\sqrt{2}$ e) 6

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1. Find the zeros and Domain of $y=-\sqrt{x^3-7x+6}$. Show the algebraic work to support the zeros and critical values.

Zeros:

Domain:

2. Find the Extreme Points of $y=-\sqrt{x^3-7x+6}$. Show the algebraic work to support the zeros and critical values.

Extreme Points:

3. Find the zeros, VAs, and domain of $y=\sqrt{\frac{x^2-5}{x^2-9}}$ on $x\in[-4,5]$. Show the Algebra that supports your answer.

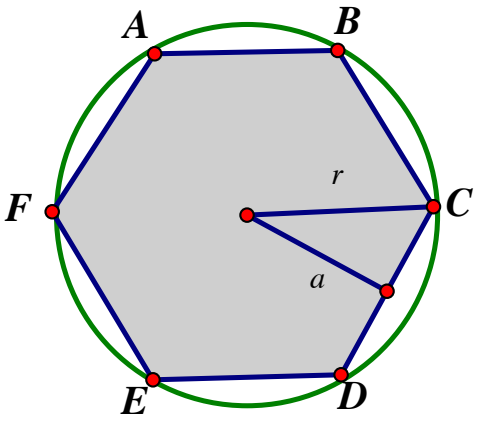
Zeros: VAs:

Domain:

4. Find the Extreme Points of $y=\sqrt{\frac{x^2-5}{x^2-9}}$ on $x\in[-4,5]$. Show the Algebra and derivative that supports your answer.

Extreme Points:

5. A regular hexagon is inscribed in a circle. The circle's circumference is expanding at 4π in/sec and the hexagon maintains the contact of its corners with the circle.



Given that the area of a regular hexagon is equal to half the apothem a times the perimeter p, find out how fast the area inside the circle but outside the hexagon is expanding when the area of the circle is $64\pi\ in$. [Hint: Find p and a in terms of r.]

6. A particular velocity function is given by the equation $v(t)=\sqrt{\left[\left(\frac{E(t)}{3}+3t\right)^{3/7}-4\right]}$. What is the equation for the acceleration?

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Radical Functions Test – NO CALCULATOR ALLOWED

Show all work.

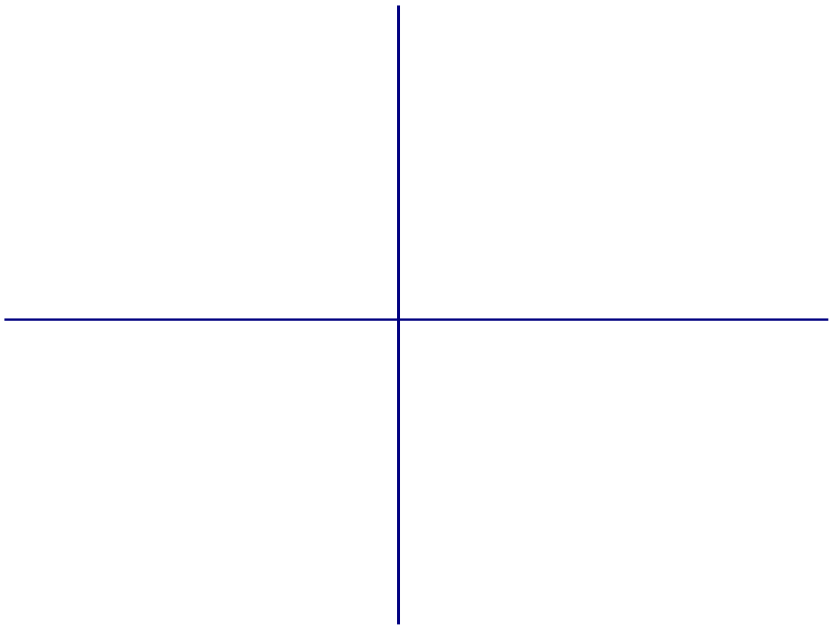
7. Find the traits and **sketch** $y = -\sqrt{x^3 - 7x + 6}$.

Domain: Range:

Y – Int:

Zeros: Extreme Points:

End Behavior (Left): End Behavior (Right):



8. List the traits and **sketch** of $y=\sqrt{\dfrac{x^2-5}{x^2-9}}$ on $x\in[-4,5]$.

Domain: Range:

Y – Int: VAs:

Zeros: Extreme Points:

End Behavior (Left):

End Behavior (Right):