

Round to 3 decimal places. Show all work.

1. Let $f(x)$ be the function $f(x) = \sqrt{x+4}$. Using the tangent line approximation to the graph of $f(x)$ at $x=0$, estimate $f(0.04)$.

- a. 2.01 b. 2.02 c. 2.03 d. 2.04 e. 2.05

2. Given this sign pattern $\frac{dy}{dx}$ $\leftarrow \begin{array}{cccccc} + & 0 & 0 & - & 0 & + & 0 & 0 & - \\ -2 & -\sqrt{2} & 0 & \sqrt{2} & 2 \end{array} \rightarrow$, at

what value of x does f have a local minimum?

- (a) -2 (b) $-\sqrt{2}$ (c) $\sqrt{2}$ (d) All of these (e) None of these

3. Gravel is being dumped from a conveyor belt at a rate of $35 \text{ ft}^3/\text{min}$ and its coarseness is such that it forms a pile in the shape of a cone whose base diameter and height are always equal. How fast is the height of the pile increasing when the pile is 15ft high?

- a) 0.27 ft/min
 b) 1.24 ft/min
 c) 0.14 ft/min
 d) 0.2 ft/min
 e) 0.6 ft/min

4. If $f(x) = (x^2 - 2x - 1)^{2/3}$, then $f'(0) =$

- a) $\frac{4}{3}$ b) 0 c) $-\frac{2}{3}$ d) $-\frac{4}{3}$ e) -2
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5. For what values of x does the curve $y^2 - x^3 - 15x^2 = 8$ have horizontal tangent lines?

- a) $x = -10$ only
b) $x = 0$ only
c) $x = 10$ only
d) $x = 0$ and $x = -10$
e) $x = -10$, $x = 0$, and $x = 10$
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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	2	8	2	3
8	8	-12	2	4

Given that $h(x) = g(f(x))$, $h'(4) =$

- a) -6 b) -2 c) -1 d) 8 e) 24
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7. Find the absolute maximum value of $y = \sqrt{36 - x^2}$ on the interval $x \in [-2, 2]$.

- a) 5 b) 6 c) 7 d) 0 e) 1
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PreCalculus Honors '15-16

Name: _____

Dr. Quattrin

Radical Functions Test -- CALCULATOR ALLOWED

Round to 3 decimal places.

Score _____

Show all work.

1. Find the zeros and Domain of $y = \sqrt{x^5 - 11x^3 + 18x}$. Show the algebraic work to support the zeros and critical values.

Zeros:

Domain:

2. Find the Extreme Points of $y = \sqrt{x^5 - 11x^3 + 18x}$. Show the algebraic work to support the zeros and critical values.

Extreme Points:

3. Find the zeros, VAs, and domain of $y = \sqrt{\frac{x^2 - 9}{x^2 - 25}}$ on $x \in [-6, 7]$. Show the Algebra that supports your answer.

Zeros:

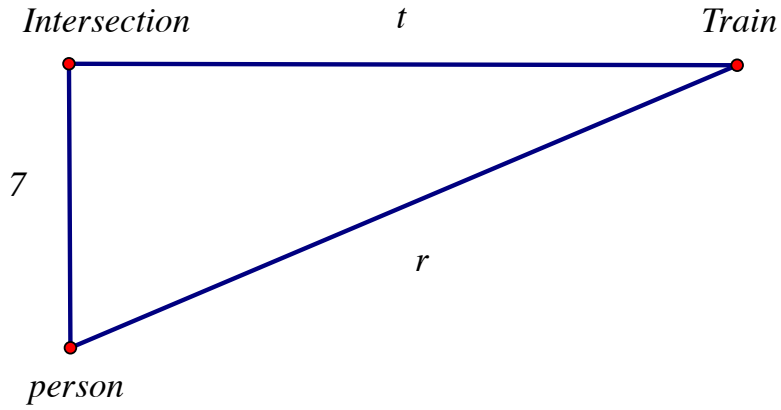
VAs:

Domain:

4. Find the Extreme Points of $y = \sqrt{\frac{x^2 - 9}{x^2 - 25}}$ on $x \in [-6, 7]$. Show the Algebra that supports your answer.

Extreme Points:

5. A railroad track and a road cross at right angles. An observer stands on the road 70 meters south of the intersection and watches an eastbound train traveling at 60 m/sec. At how many m/sec is the train moving away from the observer 4 seconds after it passes the intersection?



6. The airspeed velocity of a European swallow unladen by coconuts is given by the equation $V = A_0 \sqrt{\left[\left(\frac{Q_C}{P_0} + 1 \right)^{2/7} - 1 \right]}$ where A_0 is the speed of sound, P_0 is the air pressure and Q_C is a function of the number of beats per minute of the swallow's wings. What is the equation for the acceleration of said swallow?

Dr. Quattrin

Radical Functions Test – NO CALCULATOR ALLOWED

Show all work.

7. Find the traits and **sketch** $y = \sqrt{x^5 - 11x^3 + 18x}$.

Domain:

Range:

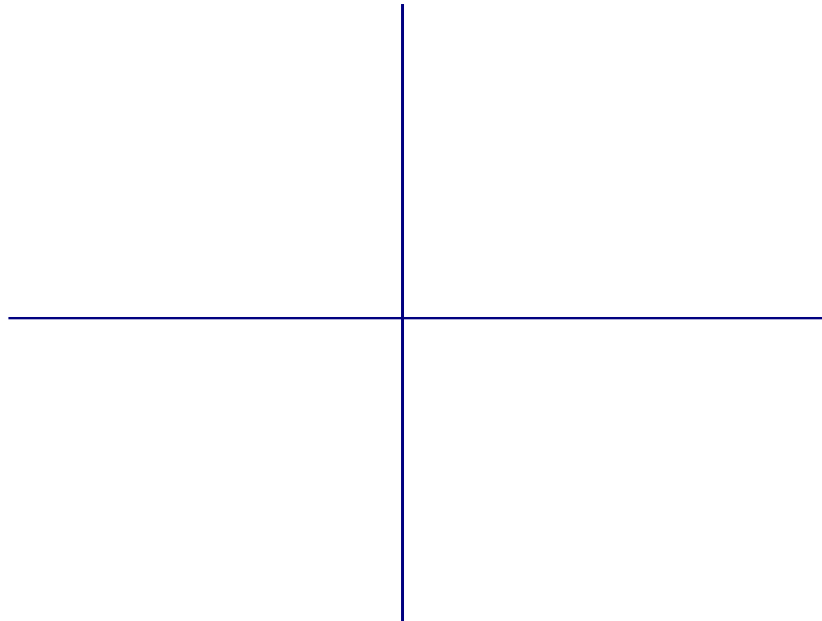
 Y – Int:

Zeros:

Extreme Points:

End Behavior (Left):

End Behavior (Right):



8. List the traits and **sketch** of $y = \sqrt{\frac{x^2 - 9}{x^2 - 25}}$ on $x \in [-6, 7]$.

Domain:

Range:

Y – Int:

VAs:

Zeros:

Extreme Points:

End Behavior (Left):

End Behavior (Right):

