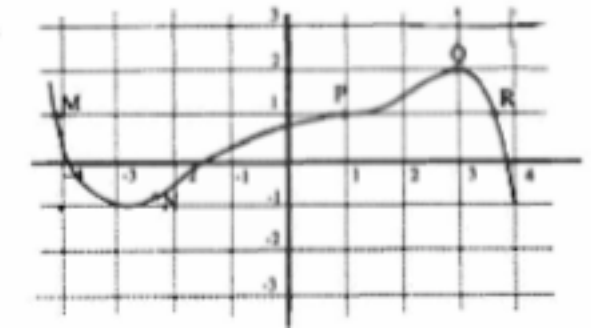
Honors Precalculus '15-16 Name:_____
Advanced Curve Graphing

score_____

2. The graph of the function $f(x)$ is shown below.



At which point on the graph of $f(x)$ are all the following true?

$f(x)>0$, $f'(x)\geq 0$, and $f''(x)<0$

(a) M (b) N (c) P (d) Q (e) R

2. If $f(x)=4x^3-21x^2+36x-4$, then the graph of $f(x)$ is decreasing and concave down on the interval

(a) $x\in\left(\frac{3}{2},2\right)$ (b) $x\in\left(-\infty,\frac{7}{4}\right)$ (c) $x\in\left(\frac{7}{4},\infty\right)$ (d) $x\in\left(\frac{7}{4},2\right)$

(e) $x\in\left(\frac{3}{2},\frac{7}{4}\right)$

3. The number of points of inflection of $f(x)=2x+\cos\left(x^2\right)$ 0n the interval $x\in[0,5]$ is

(a) 6 (b) 7 (c) 8 (d) 9 (e) 10

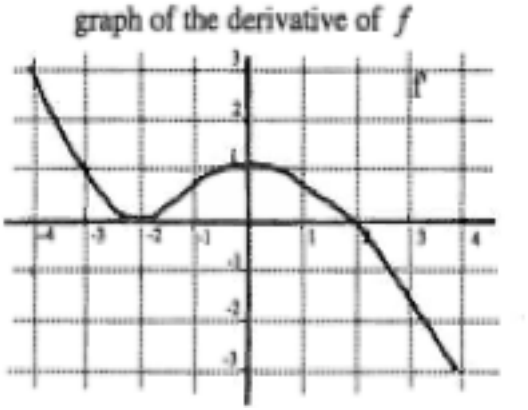
4. If $f(x) = x^4 - 18x^2$, then the graph of $f(x)$ has inflection points at

(a) $(0, 0)$ only
(b) $(2, -64)$ only
(c) $(3, -81)$ only
(d) $(0, 0)$ and $(3, -81)$
(e) None of these

5. The graph of the *derivative* of $f(x)$ is shown at the right. Which of the following is true about the function $f(x)$?

I. $f(x)$ is increasing at $x = 0$
II. $f(x)$ has a local maximum at $x = 2$
III. $f(x)$ is concave up at $x = -1$

(a) I only
(b) II only
(c) I and II only
(d) II and III only
(e) I, II, and III



6. If $f'(x) = -6(x-3)^2(x-9)$, which of the following is true about $y = f(x)$?

a) $f(x)$ has a point of inflection at $x = 3$ and a local minimum at $x = 9$.
b) $f(x)$ has a local maximum at $x = 3$ and a local minimum at $x = 9$.
c) $f(x)$ has a local minimum at $x = 3$ and a local maximum at $x = 9$.
d) $f(x)$ has a local minimum at $x = 3$ and a point of inflection at $x = 9$.
e) $f(x)$ has a point of inflection at $x = 3$ and a local maximum at $x = 9$.

Honors Precalculus '15-16 Name:_____
PreCalc Basics
Round to 3 decimal places. score_____
Show all work.

1. Given $y = \frac{x^2 - 4}{x^2 + 1}$, find the sign pattern for $\frac{dy}{dx}$ and determine if the critical values are at a maximum, minimum, or neither.

2. Given $y = \frac{x^2 - 4}{x^2 + 1}$, find the sign pattern for $\frac{d^2y}{dx^2}$ and name the points of Inflection.

3. Find the domain, zeros and VAs of $y = \ln\left(x^4 - 13x^2 + 36\right)$.

4. Find the extreme points and end behavior of $y = \ln\left(x^4 - 13x^2 + 36\right)$.

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PreCalc Basics
NO CALCULATOR ALLOWED
Show all work.

5. Set up a Key Trait table and sketch $y = \frac{x^2 - 4}{x^2 + 1}$

6. Show the Algebraic Traits and sketch $y = \ln\left(x^4 - 13x^2 + 36\right)$.

Domain: Range:

Y – Int: VAs:

Zeros: Extreme Points:

End Behavior (Left): POEs:

End Behavior (Right):