PreCalculus Honors '15-16 Name:_____
Dr. Quattrin
Chapter 10 Test
CALCULATOR ALLOWED Score _____
Round to 3 decimal places. Show all work.

1. Let f be the function given by $f(x)=3e^{2x}$ and let g be a function given by $g(x)=6x^3$. At what value of x do the graphs of f and g have parallel tangent lines?

a) -0.701 b) -0.567 c) -0.391 d) -0.302 e) -0.258

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2. $\frac{d}{dx}\left(\ln e^{3x}\right)=$

a) 1 b) 3 c) $3x$ d) $\frac{1}{e^{3x}}$ e) $\frac{3}{e^{3x}}$

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3. If $f(x)=\frac{e^{2x}}{2x}$, then $f'(x)=$

a) 1 b) $\frac{e^{2x}(1-2x)}{2x^2}$ c) e^{2x} d) $\frac{e^{2x}(1+2x)}{x^2}$ e) $\frac{e^{2x}(2x-1)}{2x^2}$

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4. $\lim_{x\to 1}\dfrac{x}{\ln x}$ is

(a) 0 (b) $\dfrac{1}{e}$ (c) 1 (d) e (e) nonexistent

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5. If $e^{g(x)} = 2x+1$, then $g'(x) =$

a) $\dfrac{1}{2x+1}$ b) $\dfrac{2}{2x+1}$ c) $2(2x+1)$ d) e^{2x+1} e) $\ln(2x+1)$

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6. If $x^2 + xy = 10$, then when $x = 2$, $\dfrac{dy}{dx} =$

(a) $-\dfrac{7}{2}$ (b) -2 (c) $\dfrac{2}{7}$ (d) $\dfrac{3}{2}$ (e) $\dfrac{7}{2}$

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7. Let $f(x) = x\ln x$. The minimum value attained by f is

(a) $-\dfrac{1}{e}$ (b) 0 (c) $\dfrac{1}{e}$ (d) -1 (e) There is no minimum.

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1. Find domain and zeros of $y = -3x\sqrt{36 - x^2}$.

2. Find the extreme points of $y = -3x\sqrt{36 - x^2}$. Show the algebraic work to support the critical values.

3. Find domain and zeros of $y=\left(3x-x^2\right)e^x$.

4. Find the extreme points of $y=\left(3x-x^2\right)e^x$. Show the algebraic work to support the critical values.

EC. Given that the formula for loans is

$$L = \frac{P\left(1-\left(1+\frac{r}{12}\right)^{-12t}\right)}{\frac{r}{12}}$$

where L=the loan amount, P= the monthly payments and r= the interest rate as a decimal (that is, 4%=.04).

Suppose that, when you graduate from college, you must begin to pay off your $100,000 student loan. If the loan was at 4% compounded monthly and you can afford to pay $900 per month, how long will it take to pay off the loan?

PreCalculus Honors '15-16 Name:_____

Chapter 10 Test

NO CALCULATOR ALLOWED Score _____

Round to 3 decimal places. Show all work.

5. $\frac{d}{dx}\left[7x^2e^{-3x}\right]$

6. $D_x\left[\left(4x^5-2\right)^6\left(3x^3+7\right)^5\right]$

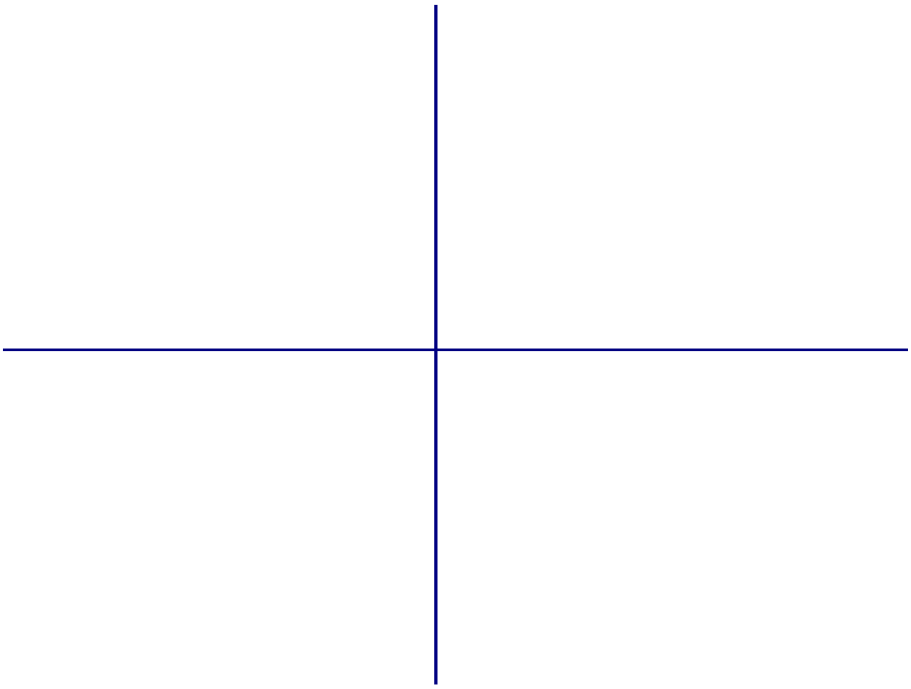
7. Find the traits and **sketch** $y = -3x\sqrt{36 - x^2}$.

Domain: Range:

Y – Int: End Behavior:

Vas: POEs:

Zeros: Extreme Values:

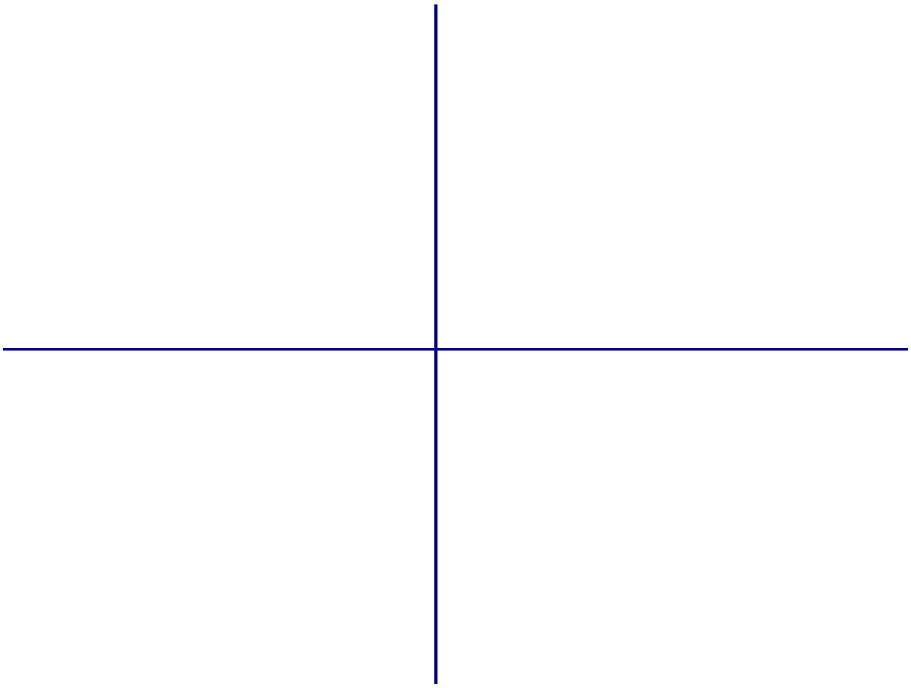


8. Find the traits and **sketch** of $y=\left(3x-x^2\right)e^x$.

Domain: Range:

Y – Int: End Behavior:

Zeros: Extreme Values:



9. Find the traits and **sketch** of $y = \begin{cases} (3x - x^2)e^x, \text{ if } x \le 0 \\ -3x\sqrt{36 - x^2}, \text{ if } 0 \le x \end{cases}$.

Domain: Range:

Y – Int: End Behavior:

Zeros: Extreme Values:

Discontinuities: Non-Differentiabilities: