Honors PreCalculus '17-18 Name:_____

Chapter 10 Test

CALCULATOR ALLOWED Score _____

Round to 3 decimal places. Show all work.

1. The equation of the line **normal** to $y = 3x\sqrt{x^2+6} - 3$ at $(0, -3)$ is

(a) $x - 3\sqrt{6}y = 9\sqrt{6}$

(b) $x + 3\sqrt{6}y = -9\sqrt{6}$

(c) $3\sqrt{6}x + y = -3$

(d) $3\sqrt{6}x - y = -3$

(e) $x + 3\sqrt{6}y = -3$

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2. If $5x^3 - 4xy - 2y^2 = 1$, then $\frac{dy}{dx} =$

(a) $\frac{15x^2 - 4}{4y + 4}$ (b) $\frac{15x^2 - 4y}{4y + 4}$ (c) $\frac{15x^2 - 4}{4y + 4x}$

(d) $\frac{15x^2 - 4}{4x + 2}$ (e) $\frac{15x^2 - 4y}{4x + 4y}$

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3. Let $f(x) = \frac{e^x}{x}$ on $x \in (0, \infty)$. The maximum value attained by f is

(a) 1 (b) e (c) $\frac{1}{e}$ (d) $e - 1$ (e) undefined

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4. 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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5. For any time $t \geq 0$, if the position of a particle in the *xy*-plane is given by $x = e^t$ and $y = e^{-t}$, then the speed of the particle at time $t = 1$ is

a) 2.693
b) 2.743
c) 3.086
d 3.844
e) 7.542

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6. What is $\lim\limits_{x \to 0} \dfrac{1-e^{3x}}{\ln(1-x)}$?

a) -1 b) -3 c) 1 d) 3 e) The limit does not exist

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7. Given the functions $f(x)$ and $g(x)$ that are both continuous and differentiable, and that have values given on the table below, find $h'(2)$, given that $h(x)=g(x)\cdot f(x)$.

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

a) -12 b) -1 c) 0 d) 64 e) 30

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Chapter 10 Test

CALCULATOR ALLOWED Score _____

Round to 3 decimal places. Show all work.

1. Find domain and zeros of $y=\left(-2x^3\right)\sqrt{3-x^2}$.

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

3. Find domain and zeros of $y=\left(x^2-7\right)e^{-x/2}$.

4. Find the extreme points of $y=\left(x^2-7\right)e^{-x/2}$. Show the algebraic work to support the critical values.

5. Find domain, VAs, and zeros of $y=\ln\left(x^3-7x+6\right)$.

6. Find the extreme points of $y=\ln\left(x^3-7x+6\right)$ on $x\in(-3,3)$. Show the algebraic work to support the critical values.

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NO CALCULATOR ALLOWED Score _____

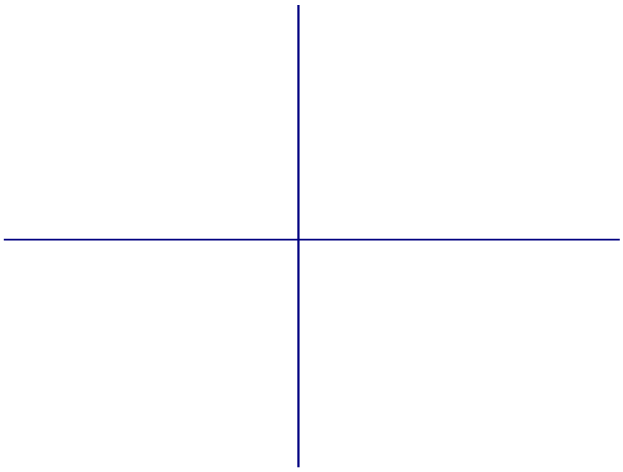
7. $y=(4x-3)^9(3x^7+1)^3$. Find $\frac{dy}{dx}$ in factored form.

DO TWO OF THE FOLLOWING THREE SKETCHING PROBLEMS

8. Find the traits and **sketch** $y=(-2x^3)\sqrt{3-x^2}$.

Y-intercept: Range:

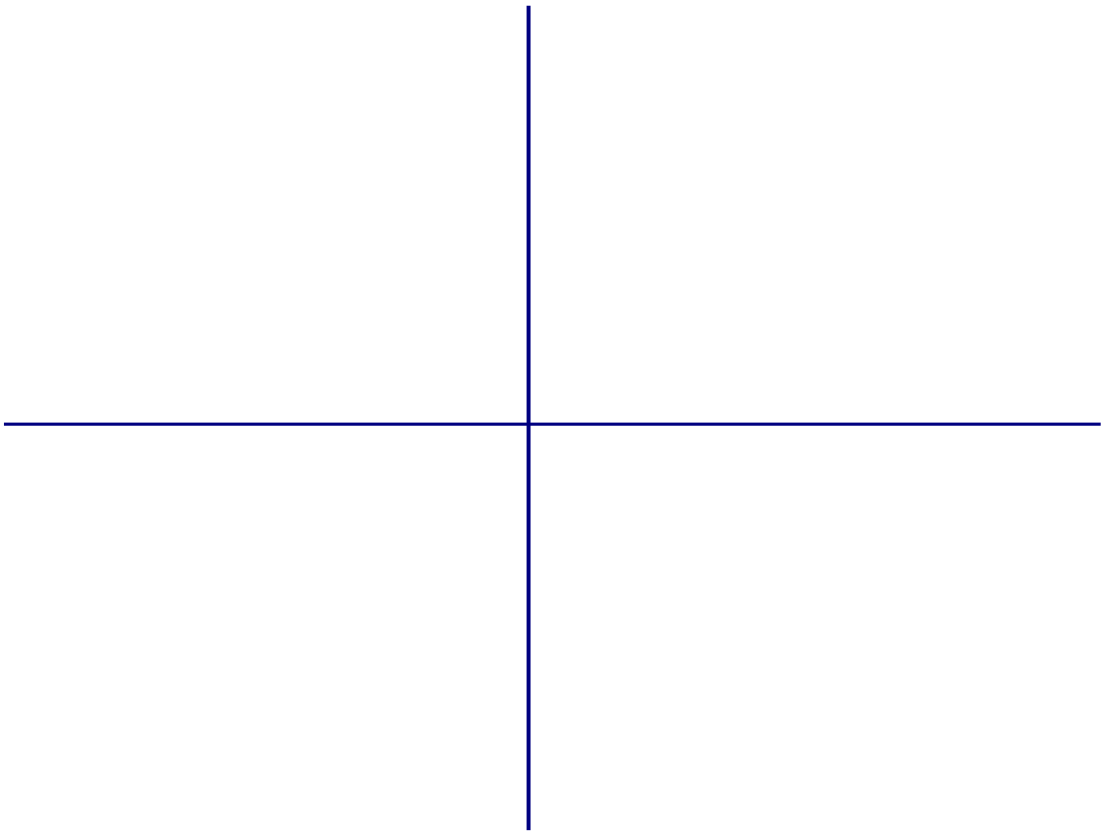
End Behavior (Left): End Behavior (Right):



9. Find the traits and **sketch** of $y=\left(x^2-7\right)e^{-x/2}$.

Y-intercept: Range:

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



10. Find the traits and **sketch** of $y=\ln\left(x^3-7x+6\right)$ on $x\in(-3,3)$.

Y-intercept: Range:

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