Honors PreCalculus '22-23
Chapter 10 Test Form A
CALCULATOR ALLOWED ( 20 min )
Round to 3 decimal places. Show all work.

1. Let $f$ be a differentiable function with $f(2)=3$ and $f^{\prime}(2)=-5$, and let $g$ be a function defined by $g(x)=x f(x)$. Which of the following is an equation of the line tangent to the graph of $g$ at the point where $x=2$ ?
a) $y=3 x$
b) $y-3=-5(x-2)$
c) $y-6=-5(x-2)$
d) $y-6=-7(x-2)$
e) $y-6=-10(x-2)$
2. The slope of the line tangent to the curve $x^{3} y+x^{2} y=12$ at $(2,1)$ is
a) $\frac{4}{3}$
b) $\frac{3}{4}$
c) $-\frac{4}{3}$
d) $-\frac{3}{4}$
e) 0
3. Let $h(t)=e^{2 t}(t-1)$ on $t \in(-\infty, \infty)$. The minimum value attained by $f$ is
a) $\frac{1}{2}$
b) $e$
c) $-\frac{1}{2} e$
d) $\frac{1}{2} \sqrt{e}$
e) there is no minimum
4. If $g(x)=\ln \left(x^{2}+4\right)$, then $g^{\prime}(2)=$
(A) $\ln 8$
(B) $\frac{1}{2}$
(C) $\frac{1}{4}$
(D) $\frac{1}{8}$
(E) dne
5. The figure below shows the graph of the functions $f$ and $g$. The graphs of the lines tangent to the graph of $g$ at $x=-3$ and $x=1$ are also shown. If $B(x)=f(x) \cdot g(x)$, what is $B^{\prime}(-3)$ ?
a) $-\frac{11}{6}$
b) $-\frac{1}{2}$
c) $-\frac{1}{6}$
d) $\frac{1}{3}$
e) $\frac{1}{2}$

6. $\lim _{x \rightarrow 0} \frac{e^{3 x}-1}{x}$
a) 0
b) $\frac{1}{3}$
c) 1
d) 3
e) dne
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 $h^{\prime}(4)$, given that $h(x)=g(x) \cdot f(x)$.

| $x$ | $f(x)$ | $f^{\prime}(x)$ | $g(x)$ | $g^{\prime}(x)$ |
| :---: | :---: | :---: | :---: | :---: |
| 2 | 4 | -2 | 8 | 1 |
| 4 | 10 | 8 | 4 | 3 |
| 8 | 6 | -12 | 2 | 4 |

a)
-12
b) 24
c) 0
d) -48
e) 62
8. Find the end behavior, if any, for $f(x)=\frac{\ln x}{x}$.
a) $y=0$ on the right
b) $\quad y=0$ on the left
c) $y=0$ on the left and right
d) Left end up
e) Left end $y=0$; right end down
9. Which of the following is the equation of this graph?

a) $y=-.1 x^{3} \sqrt{9-x^{2}}$
b) $y=-.05\left(9 x^{3}-x^{5}\right)$
c) $y=.14\left(e^{x}\right) \sqrt{9-x^{2}}$
d) $y=-.1 x \ln \left(9-x^{2}\right)$

Honors PreCalculus '22-23
Chapter 10 Test Form A
CALCULATOR ALLOWED ( 40 min )

Name: $\qquad$

Round to 3 decimal places. Show all work.

1. Find domain and zeros of $K(x)=(2 x) \sqrt{8-2 x-x^{2}}$.
2. Find the extreme points of $K(x)=(2 x) \sqrt{8-2 x-x^{2}}$. Show the algebraic work to support the critical values.
3. Find domain and zeros of $g(x)=e^{-2 x} \sqrt{x+1}$.
4. Find the extreme points of $g(x)=e^{-2 x} \sqrt{x+1}$. Show the algebraic work to support the critical values.
5. Find domain, VAs, and zeros of $h(x)=\ln \left(x^{4}-12 x^{2}+27\right)$.
6. Find the extreme points of $h(x)=\ln \left(x^{4}-12 x^{2}+27\right)$ on $x \in[-1, \infty)$. Show the algebraic work to support the critical values.

## DO TWO OF THE FOLLOWING THREE SKETCHING PROBLEMS

7. Find the traits and sketch $K(x)=(2 x) \sqrt{8-2 x-x^{2}}$.

Y-intercept:
End Behavior (Left):

Range:
End Behavior (Right):
8. Find the traits and sketch of $g(x)=e^{-2 x} \sqrt{x+1}$.

| Y-intercept: | Range: |
| :--- | :--- |
| End Behavior (Left): | End Behavior (Right): |

9. Find the traits and sketch of $h(x)=\ln \left(x^{4}-12 x^{2}+27\right)$ on $x \in[-1, \infty)$.

Y-intercept:
End Behavior (Left):

Range:
End Behavior (Right):

