Honors PreCalculus '22-23Name:\_\_\_\_\_Chapter 10 Test Form ACALCULATOR ALLOWED (20 min)Score\_\_\_\_\_Round to 3 decimal places.Show all work.Score\_\_\_\_\_

1. Let *f* be a differentiable function with f(2) = 3 and f'(2) = -5, and let *g* be a function defined by g(x) = xf(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 = 3x 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  $x^3y + x^2y = 12$  at (2, 1) is

a)  $\frac{4}{3}$  b)  $\frac{3}{4}$  c)  $-\frac{4}{3}$  d)  $-\frac{3}{4}$  e) 0

3. Let  $h(t) = e^{2t}(t-1)$  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 
$$g(x) = \ln(x^2 + 4)$$
, then  $g'(2) =$ 

(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'(-3)?



6. 
$$\lim_{x \to 0} \frac{e^{3x} - 1}{x}$$
  
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'(4), 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) 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) 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?



Honors PreCalculus '22-23	Name:
Chapter 10 Test Form A	
CALCULATOR ALLOWED (40 min	a) Score
Round to 3 decimal places. Show al	l work.

1. Find domain and zeros of  $K(x) = (2x)\sqrt{8-2x-x^2}$ .

2. Find the extreme points of  $K(x) = (2x)\sqrt{8 - 2x - x^2}$ . Show the algebraic work to support the critical values.

3. Find domain and zeros of  $g(x) = e^{-2x}\sqrt{x+1}$ .

4. Find the extreme points of  $g(x) = e^{-2x}\sqrt{x+1}$ . Show the algebraic work to support the critical values.

5. Find domain, VAs, and zeros of  $h(x) = \ln(x^4 - 12x^2 + 27)$ .

6. Find the extreme points of  $h(x) = \ln(x^4 - 12x^2 + 27)$  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  $K(x) = (2x)\sqrt{8-2x-x^2}$ .

Y-intercept:

Range:

End Behavior (Left):

End Behavior (Right):



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

Y-intercept:

Range:

End Behavior (Left):

End Behavior (Right):

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

Y-intercept:

Range:

End Behavior (Left):

End Behavior (Right):