

MAC 2233
Fall 2019

EXAM 1A

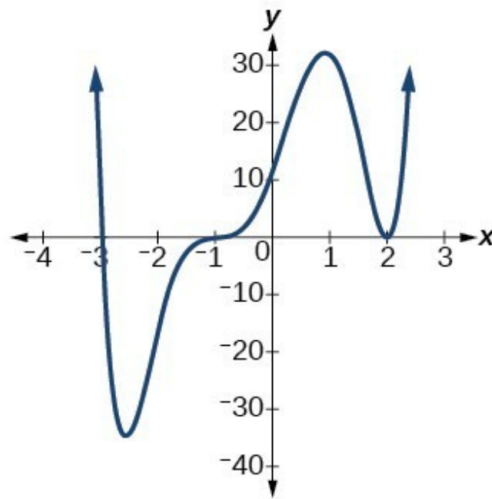
- A. Sign your bubble sheet on the back at the bottom in ink.
- B. In pencil, write and encode in the spaces indicated:
- 1) Name (last name, first initial, middle initial)
 - 2) UF ID Number
 - 3) Section Number
- C. Under “special codes”, code in the test ID number 1, 1.
- 2 3 4 5 6 7 8 9 0
- 2 3 4 5 6 7 8 9 0
- D. At the top right of your answer sheet, for “Test Form Code”, encode A.
- B C D E
- E. 1) This test consists of 6 three-point and 8 five-point multiple choice questions and two pages (both sides) of free response questions worth 30 points. The test is counted out of 80 points, but there are eight bonus points available for a total of 88 points on the exam.
- 2) The time allowed is 90 minutes.
- 3) You may write on the test.
- 4) Raise your hand if you need more scratch paper or if you have a problem with your test. **DO NOT LEAVE YOUR SEAT UNLESS YOU ARE FINISHED WITH THE TEST.**
- F. KEEP YOUR BUBBLE SHEET COVERED AT ALL TIMES.**
- G. When you are finished:
- 1) Before turning in your test, check for transcribing errors. Any mistakes you leave in are there to stay.
 - 2) Bring your test, scratch paper, bubble sheet, and any tearoff sheets to your discussion leader or proctor to turn them in. Be prepared to show your UF ID card.
 - 3) Answers will be posted in CANVAS after the test. Grades will be posted within one week.

Questions 1 - 6 are worth 3 points each.

1. Find k so that the line through $(4, -2)$ and $(k, 2)$ is parallel to $8x + 11y = 22$

- A. $\frac{2}{3}$ B. $-\frac{2}{3}$ C. $-\frac{3}{2}$ D. $\frac{3}{2}$ E. 3

2. The graph of a polynomial is given below. Determine if the degree of the polynomial is even or odd and if the leading coefficient is negative or positive.



- A. Even, Positive B. Even, Negative C. Odd, Positive
 D. Odd, Negative E. None of the Above

3. Determine which of the following is **NOT** a function.

- A. $y = -(x - 3)^2 + 4$ B. $y = 3 - \sqrt{5 - x}$ C. $y^3 = x + 4$
 D. $y^2 = -x + 7$ E. $y = \sqrt[3]{x + 6}$

4. Use the table below to answer questions 4 – 6.

	1	2	3	4
f	-1	0	1	-2
g	3	2	6	4

Evaluate $(f + g)(3)$

- A. 2 B. 7 C. 5 D. 8 E. 1
-

5. Evaluate $(f \circ g)(1)$

- A. -1 B. 3 C. 1 D. 6 E. 2
-

6. Evaluate $h(2)$ where $h(x) = \sqrt{x^2 - f(x)}$

- A. 0 B. -2 C. undefined
 D. 2 E. $\sqrt{2}$

Questions 7 - 14 are worth 5 points each.

7. The function $h(x) = (f \circ g)(x)$ is the composition of $f(x) = x^2$ and $g(x) = \frac{1}{x-8}$. Compute $h(x)$ and the domain.

- A. $h(x) = \frac{1}{x^2 - 8}; (-\infty, -2\sqrt{2}) \cup (-2\sqrt{2}, 2\sqrt{2}) \cup (2\sqrt{2}, 8) \cup (8, \infty)$
 B. $h(x) = \left(\frac{1}{x-8}\right)^2; (-\infty, -2\sqrt{2}) \cup (-2\sqrt{2}, 2\sqrt{2}) \cup (2\sqrt{2}, 8) \cup (8, \infty)$
 C. $h(x) = \left(\frac{1}{x-8}\right)^2; (-\infty, 8) \cup (8, \infty)$
 D. $h(x) = \frac{1}{x^2 - 8}; (-\infty, 8) \cup (8, \infty)$
 E. $h(x) = \left(\frac{1}{x-8}\right)^2; (-\infty, \infty)$
-

8. Solve the inequality: $\frac{x^2}{x+6} \leq 3$

A. $(-\infty, -6) \cup [3, \infty)$

B. $[-6, 3]$

C. $(-\infty, -6) \cup (3, \infty)$

D. $(-\infty, -6] \cup [-3, 6]$

E. $[-3, 6)$

9. Determine which functions are odd functions.

I. $f(x) = 2x^3 - 4x$

II. $g(x) = \frac{3}{x^2 + 2}$

III. $h(x) = \frac{x^3}{x^2 - 1}$

IV. $p(x) = -2x^5 + 3x^4 + x + 9$

A. I only

B. I and III

C. I, II and IV

D. All of the Above

E. None of the Above

10. Solve the equation $e^{x-3} = 4$

A. $3 \ln 4$

B. $\ln 4^3$

C. $3 - \ln 4$

D. $3 + \ln 4$

E. $4 + \ln 3$

11. Which of the following functions are one to one?

I. $f(x) = |x - 1|$

II. $f(x) = 3 + \sqrt{x}$

III. $f(x) = \frac{x}{x+2}$

IV. $f(x) = 3$

A. I only

B. I and II

C. II and III

D. II, III, and IV

E. None of the Above

12. Find the inverse of the one-to-one function $f(x) = \frac{x+2}{x}$.

A. $f^{-1}(x) = \frac{2x}{x-1}$

B. $f^{-1}(x) = \frac{x-2}{x}$

C. $f^{-1}(x) = \frac{2}{2+x}$

D. $f^{-1}(x) = \frac{2+x}{x}$

E. $f^{-1}(x) = \frac{2}{x-1}$

13. The supply and demand functions for a certain product are $p = x^2 + 9x + 40$ and $p = 70 - 2x^2$ respectively, where p is the price of the product and x is the number of items measured in hundreds. Find the equilibrium quantity and price.

A. 200 units; \$38

B. 200 units; \$62

C. 500 units; \$20

D. 500 units; \$110

E. 300 units; \$52

14. Use the properties of logarithms to write the expression as a sum, difference, or product of simpler logarithms.

$$\log_9 \left(\frac{9p}{2k} \right)$$

A. $1 + \log_9 p - \log_9 2 - \log_9 k$

B. $1 + \log_9 p - \log_9 2 + \log_9 k$

C. $-1 - \log_9 p - \log_9 2 - \log_9 k$

D. $1 + \log_9 p - \log_9 2k - \log_9 k$

E. None of the Above

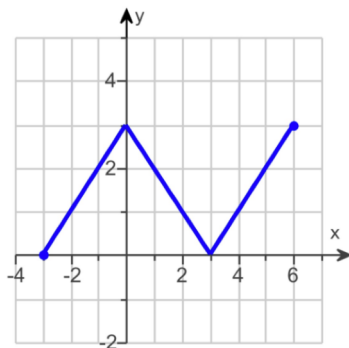
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YOU MUST SHOW ALL WORK TO RECEIVE FULL CREDIT.

1. Let $f(x) = 2x^2 - 3x + 4$. Find and simplify the difference quotient $\frac{f(x+h) - f(x)}{h}$.

2. Use the graph of the function $f(x)$ is given below. Answer the following questions.



(a) State the domain.

(b) State the range.

(c) Find $f(-3)$

(d) What are the values of x for which $f(x) = 1$

(e) Find $(f \circ f)(3)$

4. While reviewing his accounts over the past year, the manager of a mall T-shirt stand made the following observations. During a normal week, he sold an average of 40 Gator T-shirts at a price \$18 each. When he reduced the price by \$6 for a clearance sale, an average of 10 more T-shirts sold per week.
- (a) Find a linear model expressing demand x , the average number of T-shirts sold weekly as function of p , the price of a T-shirt.

$$x(p) = \underline{\hspace{2cm}}$$

- (b) One week the manager sold 58 T-shirts. Use your function to find the selling price of a T-shirt that week.