

**Student:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

**Instructor:** Krystin Manguba-Glover  
**Course:** ACMAT 117: Manguba-Glover Fall 2024

**Assignment:** Midterm 1 Practice Problems - Version 2 (ONE of 3 is REQUIRED)

1. Find the mean of the set of data. Round to the nearest tenth.

4, 1, 15, 4, 4, 11, 15, 11, 11, 1, 15, 1, 11

- A. 8.6
- B. 8.5
- C. 8.0
- D. 9.0

2. Find the median of the set of data.

10, 12, 37, 48, 64, 66, 87

- A. 64
- B. 37
- C. 47
- D. 48

3. Find the median of the set of data.

46, 16, 8, 3, 26, 11, 29, 35, 37, 34

- A. 25
- B. 27.5
- C. 29
- D. 26

4. Find the domain and range of the relation.

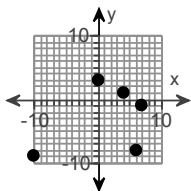
$\{(8, -2), (8,9), (-4, -6), (6,4), (-8,3)\}$

- A.  $D = \{8, -2, 6, -4, -8\}; R = \{9, 4, -6, 3, -2\}$
- B.  $D = \{9, 4, -6, 3, -2\}; R = \{8, 8, 6, -4, -8\}$
- C.  $D = \{8, 8, 6, -4, -8\}; R = \{9, 4, -6, 3, -2\}$
- D.  $D = \{8, 6, -4, -8\}; R = \{9, 4, -6, 3, -2\}$

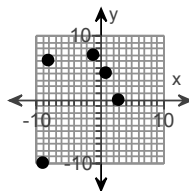
5. Plot the relation in the xy-plane.

$\{(0,3), (6, -8), (4,1), (-9, -10), (-1,7)\}$

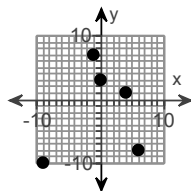
A.



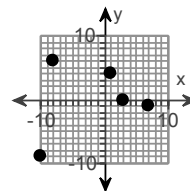
B.



C.



D.



6. Find the distance in the xy-plane between the two points. Round an approximate result to the nearest hundredth.

$(-4, 1)$  and  $(-12, -5)$

---

- A. -10.00
- B. 3.16
- C. 24.00
- D. 10.00
- 

7. Find the midpoint of the line segment joining the two points.

$(5, -8)$  and  $(-2, 5)$

---

- A.  $\left(\frac{7}{2}, -\frac{13}{2}\right)$
- B.  $(7, -13)$
- C.  $(3, -3)$
- D.  $\left(\frac{3}{2}, -\frac{3}{2}\right)$
- 

8. Find the center and radius of the circle.

$$(x + 4)^2 + (y - 6)^2 = 9$$

---

- A. Center:  $(6, -4)$ , radius = 3
- B. Center:  $(-4, 6)$ , radius = 3
- C. Center:  $(-6, 4)$ , radius = 9
- D. Center:  $(4, -6)$ , radius = 9
- 

9. Find the center and radius of the circle.

$$x^2 + 18x + 81 + y^2 - 6y + 9 = 4$$

---

- A.  $(-3, 9)$ ,  $r = 4$
- B.  $(-9, 3)$ ,  $r = 2$
- C.  $(9, -3)$ ,  $r = 4$
- D.  $(3, -9)$ ,  $r = 2$
- 

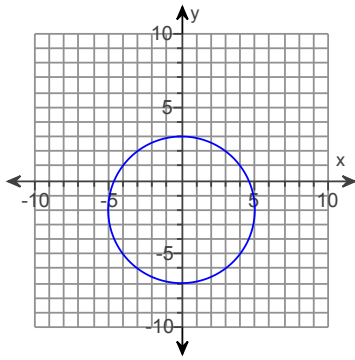
10. Find the center and radius of the circle.

$$x^2 + 16x + y^2 + 18y + 96 = 0$$

---

- A.  $(-8, -9)$ ,  $r = 49$
- B.  $(-8, -9)$ ,  $r = 7$
- C.  $(8, 9)$ ,  $r = 49$
- D.  $(8, 9)$ ,  $r = 7$
-

11. Use the graph to find the standard equation of the circle.



- A.  $x^2 + (y + 2)^2 = 5$   
 B.  $x^2 + (y + 2)^2 = 25$   
 C.  $(x + 2)^2 + y^2 = 25$   
 D.  $x^2 + (y - 2)^2 = 25$

12. Find the standard equation of the circle that satisfies the conditions.

Center (0,0), radius 10

- A.  $x^2 + y^2 = 10$   
 B.  $x^2 + y^2 = \sqrt{10}$   
 C.  $(x - 10)^2 + (y - 10)^2 = 100$   
 D.  $x^2 + y^2 = 100$

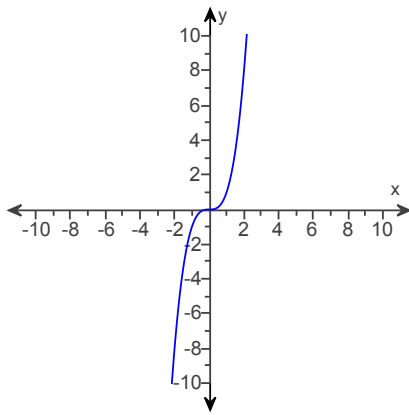
13. Find  $f(-4)$  when  $f(x) = x^2 + 2x - 7$ .

- A. 17  
 B. 15  
 C. 1  
 D. 31

14. Find  $f(-4)$  when  $f(x) = \frac{x-6}{x+3}$ .

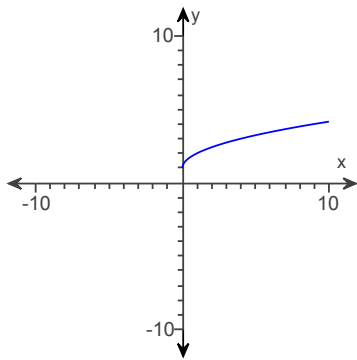
- A.  $\frac{10}{7}$   
 B. 10  
 C. -10  
 D. -2

15. Find the domain and the range for the function.



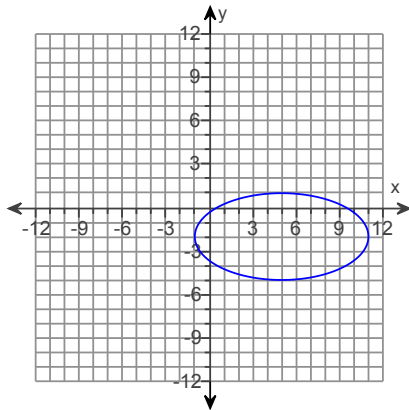
- A. D: All real numbers, R: All real numbers
- B. D:  $\{x \geq 0\}$ , R:  $\{y \geq 0\}$
- C. D:  $\{x > 0\}$ , R:  $\{y > 0\}$
- D. D:  $\{x \leq 0\}$ , R:  $\{y \leq 0\}$

16. Find the domain and the range for the function.



- A. D:  $\{x \geq 0\}$ , R:  $\{y \geq 1\}$
- B. D:  $\{x \geq -1\}$ , R:  $\{y \leq 0\}$
- C. D:  $\{x \geq 1\}$ , R:  $\{y \geq 0\}$
- D. D:  $\{x \geq 0\}$ , R:  $\{y \geq 0\}$

17. Is the relation is a function?



- Function
- Not a function

18. Is the relation is a function?

$$S = \{(-8,5), (-7,7), (-16,0), (-9,5), (-8,2)\}$$

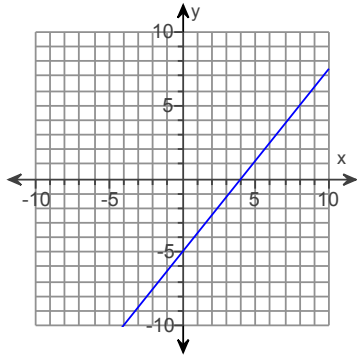
- Not a Function
- Function

19. Find the slope of the line that goes through the pair of points.

$(-8, -9)$  and  $(-8, 7)$

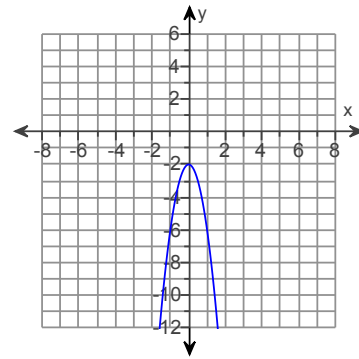
- A. 16
- B. -1
- C. 1
- D. Undefined

20. Write the equation of the line whose graph is shown.



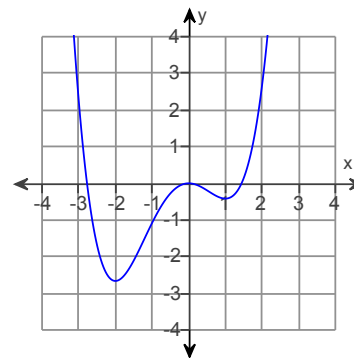
- A.  $y = 4x - 5$
- B.  $y = \frac{5}{4}x - 5$
- C.  $y = -4x - 5$
- D.  $y = \frac{4}{5}x + 4$

21. Use the graph of  $f$  to determine the intervals where  $f$  is increasing and where  $f$  is decreasing.



- A. increasing:  $(0, \infty)$ ; decreasing:  $(-\infty, 0)$
- B. increasing:  $(-\infty, \infty)$ ; decreasing: never
- C. increasing: never; decreasing:  $(-\infty, \infty)$
- D. increasing:  $(-\infty, 0)$ ; decreasing:  $(0, \infty)$

22. Use the graph of  $f$  to determine the intervals where  $f$  is increasing and where  $f$  is decreasing.



- A. increasing:  $(0, \infty)$ ; decreasing:  $(-\infty, 0)$   
 B. increasing:  $(-2, 1)$ ; decreasing:  $(-\infty, -2), (1, \infty)$   
 C. increasing:  $(-2, \infty)$ ; decreasing:  $(-\infty, -2)$   
 D. increasing:  $(-2, 0), (1, \infty)$ ; decreasing:  $(-\infty, -2), (0, 1)$
23. Complete the following for the given  $f(x)$ .
- (i) Find  $f(x+h)$ .
- (ii) Find the difference quotient of  $f$  and simplify.

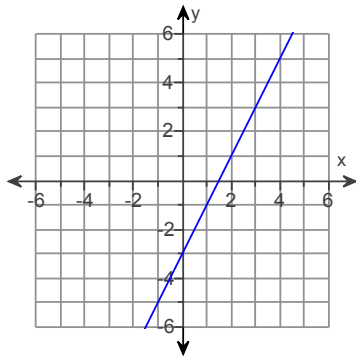
$$f(x) = 8$$

- A. (i)  $h + 8$   
(ii)  $0$   
 B. (i)  $h + 8$   
(ii)  $h$   
 C. (i)  $8$   
(ii)  $0$   
 D. (i)  $8$   
(ii)  $8$
24. Complete the following for the given  $f(x)$ .
- (i) Find  $f(x+h)$ .
- (ii) Find the difference quotient of  $f$  and simplify.

$$f(x) = 7x^2 + 11x - 10$$

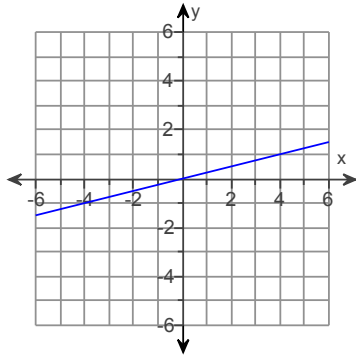
- A. (i)  $7x^2 + 14xh + 7h^2 + 11x - 10$   
(ii)  $14x + 11$   
 B. (i)  $7x^2 + 7xh + 7h^2 + 11x + 11h - 10$   
(ii)  $7x + 6 + 14h$   
 C. (i)  $7x^2 + 14xh + 7h^2 + 11x + 11h - 10$   
(ii)  $14x + 7h + 11$   
 D. (i)  $7x^2 + 14xh + 7h^2 + 11x + 11h - 10$   
(ii)  $14xh + 11h + 7h^2$

25. Write an equation in slope-intercept form for the line shown.



- A.  $y = 2x + 3$   
 B.  $y = -2x - 3$   
 C.  $y = -2x + 3$   
 D.  $y = 2x - 3$

26. Write an equation in slope-intercept form for the line shown.



- A.  $y = -4x$   
 B.  $y = \frac{1}{4}x$   
 C.  $y = 4x$   
 D.  $y = -\frac{1}{4}x$

27. Write an equation for the line passing through the given pair of points.

(4,2) and (4,8)

- A.  $8x + 2y = 0$   
 B.  $y = 2$   
 C.  $x = 4$   
 D.  $2x + 8y = 0$

28. Write the equation in slope-intercept form of the line through the given point with the given slope.

(5,3); slope:  $-7$

- A.  $y = -\frac{1}{7}x + 38$   
 B.  $y = -7x + \frac{1}{38}$   
 C.  $y = -7x - 38$   
 D.  $y = -7x + 38$

29. Find an equation of the line satisfying the following conditions. If possible, write the equation in slope-intercept form.

Through (2,4), perpendicular to  $x = 2$

---

- A.  $y = -4$
- B.  $y = 2$
- C.  $x = 2$
- D.  $y = 4$
- 

30. Determine the x- and y-intercepts on the graph of the equation.

$$y = -7(x - 4) - 3$$

---

- A. x-intercept is  $\frac{25}{7}$ ; y-intercept is 31
- B. x-intercept is  $\frac{25}{7}$ ; y-intercept is 25
- C. x-intercept is  $\frac{31}{7}$ ; y-intercept is 25
- D. x-intercept is  $-\frac{25}{7}$ ; y-intercept is  $-25$
- 

31. Determine the equation of the line described. Put the answer in the slope – intercept form, if possible.

Through (8,5), perpendicular to  $6x + 7y = 83$

---

- A.  $y = \frac{6}{7}x + 26$
- B.  $y = \frac{7}{6}x$
- C.  $y = -\frac{7}{6}x + \frac{13}{3}$
- D.  $y = \frac{7}{6}x - \frac{13}{3}$
- 

32. Find an equation of the line satisfying the following conditions. If possible, write the equation in slope-intercept form.

Horizontal, passing through (8, -3)

---

- A.  $x = -3$
- B.  $y = -3$
- C.  $y = 8$
- D.  $x = 8$
-



33. Solve the equation symbolically.

$$\frac{1}{3}(9x - 12) = \frac{1}{4}(16x - 12)$$

- A. 1
- B.  $\frac{1}{12}$
- C. -1
- D. -12

34. Solve the equation symbolically.

$$\frac{3x + 4}{5} + \frac{3x - 3}{3} = -\frac{5}{4}$$

- A.  $\frac{7}{96}$
- B.  $-\frac{21}{32}$
- C.  $-\frac{29}{32}$
- D.  $-\frac{61}{32}$

35. Classify the equation as a contradiction, an identity, or a conditional equation.

$$4(2g - 30) - 8g + 120 = 0$$

- A. Contradiction
- B. Identity
- C. Conditional

36. A store is discounting all regularly priced items by 10%. (i) Find a function  $f$  that computes the sale price of an item having a regular price of  $x$ . (ii) Find the regular price of an item that costs \$97.02 on sale. Round to the nearest cent if necessary.

- A.  $f(x) = 0.1x$ ; \$970.20
- B.  $f(x) = 0.1 + x$ ; \$96.92
- C.  $f(x) = x - 0.1x$ ; \$107.80
- D.  $f(x) = x - 0.1$ ; \$97.12

37. Solve the inequality symbolically. Express the solution set in interval notation.

$$-8 - 11x + 8 \geq -12x + 10$$

- A.  $(-\infty, 10]$
- B.  $[10, \infty)$
- C.  $(-\infty, -11)$
- D.  $(-11, \infty)$

38. Solve the inequality symbolically. Express the solution set in interval notation.

$$\frac{5x - 6}{9} > \frac{51}{5}$$

- A.  $(\frac{489}{5}, \infty)$
- B.  $(\frac{489}{25}, \infty)$
- C.  $(\frac{51}{25}, \infty)$
- D.  $(-\infty, \frac{51}{5})$

39. Solve the inequality graphically. Express the solution in set-builder notation.

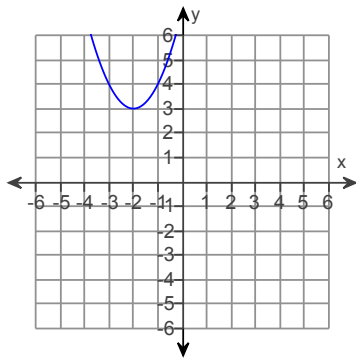
$$-4x + 12 \geq -5x + 8$$

- A.  $\{x \mid x \leq -4\}$
- B.  $\{x \mid x \geq -4\}$
- C.  $\{x \mid x > -4\}$
- D.  $\{x \mid x < -4\}$

40. If an object is dropped off of a tower, the velocity,  $V$ , of the object after  $t$  seconds can be obtained by multiplying  $t$  by 32 and adding 10 to the result. Express  $V$  as a linear function of  $t$ .

- A.  $V(t) = 32 + 10t$
- B.  $V(t) = 42t$
- C.  $V(t) = \frac{t - 10}{32}$
- D.  $V(t) = 32t + 10$

41. Use the graph of the quadratic function to determine the sign of the leading coefficient, the vertex, and the equation of the axis of symmetry.



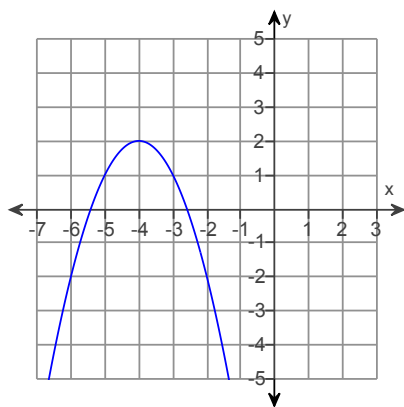
- A. Positive; (2,3);  $x = 2$
- B. Negative; (-2,3);  $x = -2$
- C. Positive; (-2,3);  $x = -2$
- D. Positive; (-2,3);  $y = 3$

42. Find the difference quotient for the function and simplify it.

$$f(x) = x^2 + 2x$$

- A.  $2xh + h + 2x$   
 B.  $2x + h$   
 C.  $h + 2$   
 D.  $2x + h + 2$

43. Use the given graph of the quadratic function  $f$  to write its formula as  $f(x) = a(x - h)^2 + k$ .



- A.  $f(x) = (x + 4)^2 + 2$   
 B.  $f(x) = -(x + 4)^2 - 2$   
 C.  $f(x) = -(x + 4)^2 + 2$   
 D.  $f(x) = -(x - 4)^2 + 2$

44. Determine the vertex of the graph of  $f$ .

$$f(x) = 2x^2 + 8x + 5$$

- A.  $(-2, -3)$   
 B.  $(3, 2)$   
 C.  $(2, 3)$   
 D.  $(-3, -2)$

45. Write the equation as  $f(x) = a(x - h)^2 + k$ . Identify the vertex.

$$f(x) = x^2 + 6x - 4$$

- A.  $f(x) = (x + 6)^2 - 40; (-6, -40)$   
 B.  $f(x) = (x + 3)^2 - 13; (-3, -13)$   
 C.  $f(x) = (x + 3)^2 - 13; (-13, -3)$   
 D.  $f(x) = (x + 6)^2 - 40; (-40, -6)$

46. The length of a table is 7 inches more than its width. If the area of the table is 1,794 square inches, what is its length?

- A. 78 in.  
 B. 32 in.  
 C. 46 in.  
 D. 39 in.

47. Solve the quadratic equation.

$$7x^2 + 6x + 1 = 0$$

---

- A.  $\frac{-6 \pm \sqrt{2}}{7}$
- B.  $\frac{-3 \pm \sqrt{2}}{14}$
- C.  $\frac{-3 \pm \sqrt{1}}{7}$
- D.  $\frac{-3 \pm \sqrt{2}}{7}$
- 

48. Solve by completing the square.

$$25c^2 + 24 = -70c$$

---

- A.  $\frac{2}{5}, \frac{12}{5}$
- B.  $\frac{-12}{25}, \frac{36}{25}$
- C.  $\frac{-2}{5}, \frac{-12}{5}$
- D.  $\frac{-2}{25}, \frac{-12}{25}$
- 

49. Solve the following equation.

$$x^2 + 3x + 2 = 0$$

---

Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

- A. The solution(s) is(are)  $x =$   .  
(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
- B. There are no real solutions.
- 

50. Solve.

$$2a^2 = 5a + 3$$

Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

- A. The solution(s) is(are)  $a =$   .  
(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
- B. There are no real solutions.

1. C. 8.0

---

2. D. 48

---

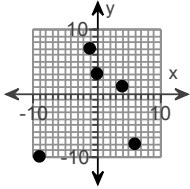
3. B. 27.5

---

4. D.  $D = \{8, 6, -4, -8\}$ ;  $R = \{9, 4, -6, 3, -2\}$

---

5.



C.

---

6. D. 10.00

---

7. D.  $\left(\frac{3}{2}, -\frac{3}{2}\right)$

---

8. B. Center:  $(-4, 6)$ , radius = 3

---

9. B.  $(-9, 3)$ ,  $r = 2$

---

10. B.  $(-8, -9)$ ,  $r = 7$

---

11. B.  $x^2 + (y + 2)^2 = 25$

---

12. D.  $x^2 + y^2 = 100$

---

13. C. 1

---

14. B. 10

---

15. A. D: All real numbers, R: All real numbers

---

16. A. D:  $\{x \geq 0\}$ , R:  $\{y \geq 1\}$

---

17. Not a function

---

18. Not a Function

---

19. D. Undefined

---

20. B.  $y = \frac{5}{4}x - 5$

---

21. D. increasing:  $(-\infty, 0)$ ; decreasing:  $(0, \infty)$

---

22. D. increasing:  $(-2, 0), (1, \infty)$ ; decreasing:  $(-\infty, -2), (0, 1)$

---

23. C. (i) 8(ii) 0

---

24. C. (i)  $7x^2 + 14xh + 7h^2 + 11x + 11h - 10$ (ii)  $14x + 7h + 11$

---

25. D.  $y = 2x - 3$

---

26. B.  $y = \frac{1}{4}x$

---

27. C.  $x = 4$

---

28. D.  $y = -7x + 38$

---

29. D.  $y = 4$

---

30. B. x-intercept is  $\frac{25}{7}$ ; y-intercept is 25

---

31. D.  $y = \frac{7}{6}x - \frac{13}{3}$

---

32. B.  $y = -3$

---

33. C.  $-1$

---

34. B.  $-\frac{21}{32}$

---

35. B. Identity

---

36. C.  $f(x) = x - 0.1x$ ; \$107.80

---

37. B.  $[10, \infty)$

---

38. B.  $(\frac{489}{25}, \infty)$

---

39. B.  $\{x \mid x \geq -4\}$

---

40. D.  $V(t) = 32t + 10$

---

41. C. Positive;  $(-2, 3)$ ;  $x = -2$

---

42. D.  $2x + h + 2$

---

43. C.  $f(x) = -(x + 4)^2 + 2$

---

44. A.  $(-2, -3)$

---

45. B.  $f(x) = (x + 3)^2 - 13$ ;  $(-3, -13)$

---

46. C. 46 in.

---

47. D.  $\frac{-3 \pm \sqrt{2}}{7}$

---

48. C.  $\frac{-2}{5}, \frac{-12}{5}$

---

49. A. The solution(s) is(are)  $x = \boxed{-1, -2}$ .

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

---

50. A. The solution(s) is(are)  $a = \boxed{3, -\frac{1}{2}}$ .

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

---