

Printed Name _____

Signed Name _____

PID _____

Section Number _____

Instructions:

1. The exam consists of problems numbered 1 – 28. Request a new copy of the exam if any of the problems are missing or hard to read.
2. You will need a pen or pencil, one calculator, and this booklet for the exam. Remove everything else from your desk. Calculators may not be shared.
3. Your TA cannot answer questions about the exam problems or the use of calculators.
4. Please check the board for possible corrections to the exam.
5. You must show your work when directed to do so or credit will not be given.
6. If you use a graph from your calculator, sketch it on your exam paper, along with enough markings on the axes to indicate your viewing rectangle.
7. Unless specified otherwise, calculator approximations must be rounded to 5 decimal places.

Pg.2 /	Pg.3 /	Pg.4 /	Pg.5 /	Pg.6 /	Pg.7 /	Pg.8 /	Pg.9 /	Total /200

Questions 1 – 15 are multiple choice (5 points each). Circle the correct answer. There is only one correct answer for each problem.

1. What is the domain of the function $\{(-5, -3), (4, -1), (1, 0), (12, 7)\}$?

- (A) $\{-5, -3, -1, 0, 1, 4, 7, 12\}$ (B) $\{-3, -1, 0, 7\}$ (C) $\{-5, 12\}$
(D) $\{-5, 4, 1, 12\}$ (E) None of these
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2. What is the area of the rectangle, which is 13 meters long and 9 meters wide?

- (A) 22 square meters (B) 117 square meters (C) 44 square meters
(D) 234 square meters (E) None of these
-

3. Which of the following equations represents the equation of a line parallel to $2x + 20y = 5$?

- (A) $30y + 3x = 1$ (B) $10x + y = 20$ (C) $y = 10x + 2$
(D) $x + 20y = 10$ (E) None of these
-

4. Which of the following is equivalent to $a^{-\frac{5}{7}}$?

- (A) $a^{\frac{7}{5}}$ (B) $\frac{1}{\sqrt[7]{a^5}}$ (C) $\frac{1}{\sqrt[5]{a^7}}$ (D) $a^{-\frac{7}{5}}$ (E) None of these
-

5. Which of the following is equivalent to 1.3×10^{-3} ?

- (A) 0.013 (B) 1300 (C) 0.13 (D) 0.0013 (E) None of these
-

6. What is the vertex of $h(x) = 4 - 3x^2$?

- (A) (4, 0) (B) (3, -4) (C) (-3, -4) (D) (0, 3) (E) None of these
-

7. Which of the following represents the slope of a line perpendicular to $y - 3x = 7$?

- (A) $-\frac{1}{3}$ (B) 3 (C) -3 (D) $\frac{1}{3}$ (E) None of these
-

8. How many y-intercepts does $g(x) = 3x^2 - x + 24$ have?

- (A) One (B) None (C) Two
-

9. Which of the following is equivalent to $\frac{\frac{3}{7}}{\frac{5}{14}}$?

- (A) $\frac{15}{98}$ (B) $\frac{6}{5}$ (C) $\frac{3}{10}$ (D) $\frac{5}{6}$ (E) None of these
-

10. Which of the following is equivalent to $\sqrt[8]{x^5 y^{13}}$ (assume that $x > 0, y > 0$)?

- (A) $x^{\frac{8}{5}} y^{\frac{8}{13}}$ (B) $(xy)^{\frac{65}{8}}$ (C) $x^{\frac{5}{8}} y^{\frac{13}{8}}$ (D) $x^{-3} y^5$ (E) None of these
-

11. Consider the function $f(x) = -\frac{21}{x}$. Which of the following is equivalent to $f(-\frac{1}{3})$?

- (A) 63 (B) -7 (C) 7 (D) -63 (E) None of these
-

12. Which of the following is equivalent to $\frac{1}{3b} + \frac{1}{b}$?

- (A) $\frac{3}{4b}$ (B) $\frac{4}{3b}$ (C) $\frac{1}{4b}$ (D) $\frac{1}{b}$ (E) None of these
-

13. Which of the following points is not on the graph of $p(x) = (x + 2)^3$?

- (A) (0, 8) (B) (-2, 0) (C) (-3, 1) (D) (-4, -8) (E) None of these
-

14. The domain of the function $f(x) = \frac{x-2}{x^2+4x-5}$ is all real numbers except

- (A) 5 and -1 (B) 1 and -5 (C) 2 and 1
(D) -5 and 2 (E) None of these
-

15. Which of the following is equivalent to $(2\sqrt{5} + \sqrt{7})(2\sqrt{5} - \sqrt{7})$?

- (A) 3 (B) 13 (C) -13 (D) -3 (E) None of these
-

16 – 20 (5 points each). The following statements are either always true (T) or not always true (F). Circle the one choice that best describes each.

16. Any quadratic function has exactly two x-intercepts. T F

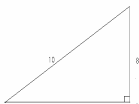
17. $(a-b)(a-b)(a-b) = a^3 - b^3$. T F

18. $x - 8y$ is a factor of $x^2 - 64y^2$. T F

19. $\sqrt{20}$ is an irrational number. T F

20. The slope of any vertical line is undefined. T F

21. (5 points) Find the missing side. Show all your work.



Answer _____

22. (9 points) Solve the compound inequality and graph your solution on the number line. Show all your work.

$$6x + 10 \geq 22 \text{ and } 11 - 2x > -13$$

Answer _____

23. (12 points) With the current a motorboat can travel 72 miles in 2 hours. Against the current the same trip takes 3 hours. How fast can the boat travel in still water? What is the speed of the current? Give units with your answers. Show all your work.

Speed of boat in still water _____

Speed of the current _____

24. (16 points) Perform the indicated operations and simplify your answers completely. Do not leave negative exponents in your answers. Show all your work.

$$(a) \left(\frac{-125a^8b^{-3}c^9}{a^2b^0c^{-6}} \right)^{\frac{1}{3}}$$

Answer _____

$$(b) \frac{x^2y^3 - 2xy^3}{x^2 - 4x + 4} \div \frac{x^{-2}y^4}{x^3 - 8}$$

Answer _____

25. (12 points) Jack throws a ball into the air at a speed of 32 feet per second upward from a 60-foot platform. The height of the ball above the ground is given by the function $h(t) = -16t^2 + 32t + 60$. What is the maximum height of the ball? How long does it take for the ball to reach the ground? Round your answers to 2 decimal places. Give units with your answers. Show all your work.

The maximum height_____

The amount of time it takes the ball to reach the ground_____

26. (6 pts) Solve for r . Show all your work.

$$A = \frac{5rK}{A-r}$$

Answer_____

27. (36 points) Solve each of the following equations algebraically. Show all your work.

(a) $-3(2x-9) - 2(1-x) = 21$

Answer _____

(b) $2y^2 - 3 = 4y$

Answer _____

(c) $\frac{x}{x+3} + \frac{2x-6}{x^2-9} = \frac{x}{x-3}$

Answer _____

(d) $\sqrt{4-y} - y = -2$

Answer _____

28. (4 points) Write a quadratic equation having the solutions $-\frac{1}{3}$ and -2 . Show all your work.

Answer _____
