

MATH 150
Fall 2007
Aurisp
Exam 1 - Form A

PRINTED Name: _____ Section Number: _____

Please read and sign below:

On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work.

Signature: _____

Instructions:

- Part I is Multiple Choice and True/False. Clearly circle the letter of your answer.
- Part II is Work Out. Show ALL your work. Partial credit is possible. A correct answer without any work will NOT receive full credit. Please write clearly and legibly, and write your final answer in the blanks provided.
- Calculators are not allowed for this exam.
- There are problems on both the front and back of the pages. So make sure you answer them all.
- **Academic Dishonesty Will NOT Be Tolerated.**

GOOD LUCK. DO YOUR BEST.

Part I: Multiple Choice. Each problem is worth 5 points. Clearly indicate your answers.

- How many real solutions does the equation $2x^2 - 4x - \frac{10}{4} = 0$ have?
 - None
 - One
 - Two
 - Three
 - Not enough information

- Rationalize the denominator of the expression $\frac{x}{\sqrt{x} - 5}$.
 - $\frac{x\sqrt{x} + 5x}{x - 25}$
 - $\frac{x\sqrt{x} - 5x}{x - 25}$
 - $\frac{x^2}{x - 25}$
 - $\frac{x\sqrt{x} + 5x}{x - 5}$
 - $\frac{x\sqrt{x} - 5x}{x - 5}$

- How would the graph of $f(x) = \sqrt{x}$ be transformed to get the graph $g(x) = \sqrt{-5(x + 3)}$?
 - Horizontally shrink by a factor of $\frac{1}{5}$, reflect across the y -axis, shift right 3 units
 - Horizontally shrink by a factor of $\frac{1}{5}$, reflect across the x -axis, shift left 3 units
 - Horizontally stretch by a factor of 5, reflect across the x -axis, shift right 3 units
 - Horizontally shrink by a factor of $\frac{1}{5}$, reflect across the y -axis, shift left 3 units
 - Horizontally stretch by a factor of 5, reflect across the x -axis, shift left 3 units

- Let $f(x) = x - 3$ and $g(x) = x^2 + 2x$. Find $(g \circ f)(x)$.
 - $x^2 - 4x + 9$
 - $x^2 + 2x - 15$
 - $x^2 + 2x - 3$
 - $x^2 - 4x + 3$
 - None of the above

5. Find the equation of the line that has an x -intercept of 5 and is perpendicular to the line $y = \frac{1}{2}x + 6$.
- (a) $y = \frac{1}{2}x - \frac{5}{2}$
 - (b) $y = -2x + 10$
 - (c) $y = -2x + 5$
 - (d) $y = \frac{1}{2}x + 5$
 - (e) None of the above

6. Find the range of the quadratic function $f(x) = -2x^2 + 12x - 20$.
- (a) $(-\infty, 3]$
 - (b) $(-\infty, -2]$
 - (c) $[-2, \infty)$
 - (d) $[3, \infty)$
 - (e) None of the above

7. Simplify the following expression completely and write without negative exponents:

$$\left(\frac{x^{-3}}{9^{1/2}}\right)(xy^3)^2$$

- (a) $\frac{y^6}{3x}$
 - (b) $\frac{81y^6}{x}$
 - (c) $\frac{y^9}{3x^6}$
 - (d) $\frac{81y^9}{x^6}$
 - (e) $\frac{y^9}{3x}$
 - (f) None of the above
8. Solve the inequality $|4x + 6| \geq 10$.
- (a) $[1, \infty)$
 - (b) $[-4, 1]$
 - (c) $(-\infty, -4]$
 - (d) $(-\infty, 1]$
 - (e) None of the above

9. A right triangle has a hypotenuse which is exactly 6 times the length of the shorter leg. Find a function $A(x)$ which models the area of the triangle, A , in terms of the length, x , of the shorter leg.

(a) $A(x) = \frac{\sqrt{5}}{2}x^2$

(b) $A(x) = \frac{\sqrt{35}}{2}x^2$

(c) $A(x) = \frac{5}{2}x^2$

(d) $A(x) = \frac{35}{2}x^2$

(e) $A(x) = 3x^2$

(f) None of the above

10. Circle True or False for each of the following statements. (Each one is worth 2 points.)

(a) TRUE FALSE $\sqrt{x^2 + y^2} = x + y$

(b) TRUE FALSE The function $f(x) = -2|x - 2| - 4$ is a one-to-one function.

(c) TRUE FALSE The solution to the inequality $1 \leq \frac{10}{x}$ is $(-\infty, 10]$.

(d) TRUE FALSE If a function f has domain $[0, 6]$, a function g has domain $[-1, 3]$, and $f(g(x)) = \frac{1}{x-2}$, then the domain of $f \circ g$ is $[-1, 2) \cup (2, 3]$.

Part II: Work-Out Problems. Show ALL your work to receive partial credit. Write your final answers in the blanks provided.

11. (9 points) Find the inverse function for $f(x) = \frac{3}{x+1}$.

Answer: _____

12. (10 points) Solve the equation: $\sqrt{x-1} + 3 = x$

Answer: _____

13. (10 points) Find the average rate of change of the function $f(x) = \frac{4}{x}$ from $x = 2$ to $x = 2 + h$. Simplify completely.

Answer: _____

14. (8 points) Find the center and radius for the circle $x^2 + y^2 - 10x + 21 = 0$.

Center: _____ Radius: _____

15. (10 points) Find the domain of the function $f(x) = \frac{\sqrt{25 - x^2}}{x - 3}$. Write your answer in interval notation and show ALL work to justify your answer.

Answer: _____