

Name: _____

Student ID: _____

Instructor: _____

Class Hour: _____

Instructions:

- (1) Please fill in all the above information and write your name on the top of each of the 4 exam pages.
- (2) The point value on each problem appears to the left of the problem.
- (3) *You must show sufficient work to justify all answers.* Correct answers with inconsistent work will not be given credit.
- (4) No partial credit will be given on problems 1-3. Partial credit may be obtained on problems 4-10 provided sufficient work is shown.
- (5) Circle the letter of the correct answer in problems 1-3 and write the answers to problems 4-10 in the spaces provided.
- (6) No books or papers are allowed. Calculators may be used where appropriate.
- (7) The exam is self-explanatory. Please do *not* ask the instructors to interpret any of the exam questions.

Page	Points	Max Possible
1		24
2		32
3		22
4		22
Total		100

Name: _____

Circle your answer for problems 1-3. You must show correct work to receive credit.

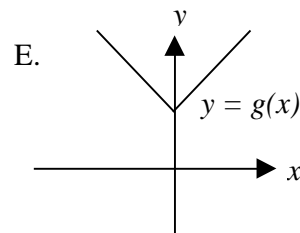
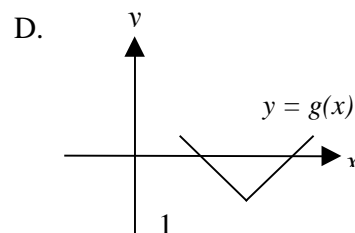
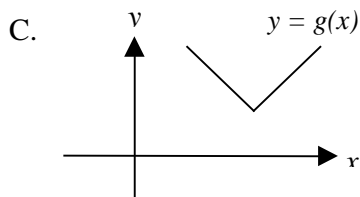
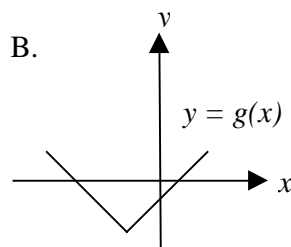
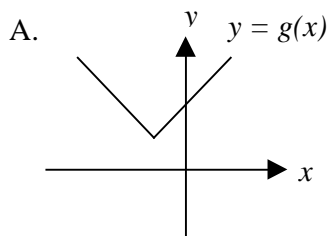
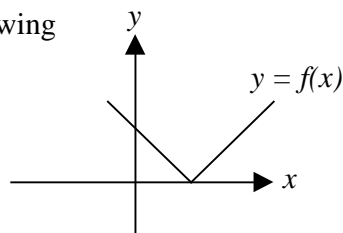
(8 pts) 1. Find the minimum value of the function $f(x) = x^2 - 2x - 8$.

- A. -5
- B. -11
- C. -9
- D. 1
- E. None of the above

(8 pts) 2. If $f(x) = x^2 + 5$, find $\frac{f(a+h) - f(a)}{h}$.

- A. $2a + h$
- B. h
- C. $2a + h + 5$
- D. $2a$
- E. $\frac{2ah + h^2 + 10}{h}$

(8 pts) 3. Given the graph of $y = f(x)$ on the right, which of the following graphs best expresses the graph of $g(x) = f(x + 3) - 2$?



Name: _____

Place your answer in the spaces provided. You must show correct work to receive credit.

(12 pts) 4. Let $f(x) = \frac{5}{3x + 1}$. Find the inverse function of f . Simplify your answer.

$f^{-1}(x) =$

(10 pts) 5. Let $f(x) = 3x^2 - 4$ and $g(x) = x + 5$. Find and simplify (if appropriate) each of the following:

(4 pts) (a) $(f - g)(-2)$

$(f - g)(-2) =$

(6 pts) (c) $(g \circ f)(x)$

$(g \circ f)(x) =$

(10 pts) 6. Find the standard equation, $y = a(x - h)^2 + k$, of the parabola that has vertex $V(-3, -2)$ and x -intercept 1.

$y =$

Name: _____

Place your answer in the spaces provided. You must show correct work to receive credit.

(10 pts) 7. y is directly proportional to the square of w and inversely proportional to the product of x and z .

(4 pts) (a) Express y in terms of w , x , z , and a constant of proportionality k .

$$y = \boxed{\phantom{\hspace{10em}}}$$

(6 pts) (b) If $w = 3$, $x = 4$, and $z = 5$, then $y = 18$. Find y when $w = -2$, $x = 5$, and $z = 10$.

$$y = \boxed{\phantom{\hspace{10em}}}$$

(12 pts) 8. Solve the following system of equations algebraically (Do not solve by graphing):
Give your answer(s) as point(s).

$$4x - 9y = 9$$

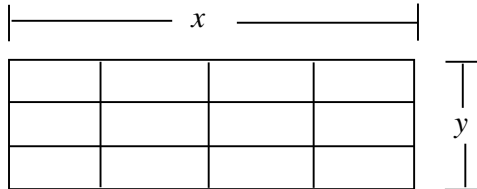
$$xy = 1$$

$$\boxed{\phantom{\hspace{20em}}}$$

Name: _____

Place your answer in the spaces provided. You must show correct work to receive credit.

- (10 pts) 9. A rectangular field is going to be enclosed by a fence and the field will also be divided into twelve rectangular plots by placing three fences parallel to the shorter sides and two fences parallel to the longer sides (see the figure). If there are 1600 total feet of fencing available, express the total enclosed area, A , of the rectangular field as a function of the length of the longer side, x . You needn't simplify your expression.



$A(x) =$

- (12 pts) 10. Twelve gallons of a 25% acid solution is to be obtained by mixing a 10% solution with a 50% solution. How many gallons of each type of solution should be used?
(Name your variable(s), set up an equation(s), and solve.)

Amount of 10% solution =

Amount of 50% solution =

Name: _____

