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. There is no credit given on any problem for guessing correctly. On all word problems, you must set up an algebraic equation(s).
(4) No partial credit will be given on problems 1-3. Partial credit may be obtained on problems 4-9 provided sufficient work is shown.
(5) Circle the letter of the correct answer in problems 1-3 and write the answers to problems 4-9 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.

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

(8 pts) 1. Find $g(-3)$ if $g(x) = \frac{x^2 + x - 6}{x^2 - 2}$

A. 0
B. 9
C. undefined
D. $\frac{-9}{4}$
E. None of the above

(8 pts) 2. Find the remainder if $2x^3 - x^2 + 4$ is divided by $x + 3$.

A. 49
B. $-59$
C. 2
D. $-17$
E. None of the above

(8 pts) 3. Subtract and simplify your answer completely:

$$\frac{5}{2a-3} - \frac{2}{a}$$
(16 pts) 4. Solve for $x$:

(a) $x^2 - 5x = 0$

$x = \boxed{0, 5}$

(b) $\frac{4}{x} + \frac{5}{x - 3} = \frac{7x}{x^2 - 3x}$

$x = \boxed{10}$

(12 pts) 5. Divide and simplify completely. Leave your answer in factored form.

$$\frac{x^2 + x}{x^2 - 2x - 3} \div \frac{x^2 - 1}{x^2 - 4x + 3}$$

$\boxed{\frac{x}{x - 3}}$
Place your answer in the space provided. You must show your work to receive credit.

(14 pts) 6. Factor each of the following completely:

(8 pts) (a) \(12x^4y^3 - 3x^2y^7\)

(6 pts) (b) \(4a^2 + 4ab - ac - bc\)

(10 pts) 7. Simplify each of the following. Assume all variables represent positive values.
Place your answer in the space provided. You must show your work to receive credit.

(12 pts) 8. The rate a canoeist can paddle in still water is 6 miles per hour. A canoeist paddles 5 miles downstream in the same amount of time it takes him to go 3 miles upstream. Find the rate of the current of the river. (Name the variable, set up an equation, and solve.)

rate of current =

(12 pts) 9. A rectangular pool is 30 feet by 26 feet. A walkway of uniform width, $x$ feet, is to surround the pool. After the walkway is completed, the total area (pool plus walkway) will be 1020 square feet. Find the width of the walkway. (Set up an equation, and solve.)

$30$$x$$26$$x$
width of walkway =