Name: ___________________________________________

Student ID: _______________________________________

Instructor: ________________________________________

Class Hour: _______________________________________

INSTRUCTIONS:
(1) There is no credit for guessing. You must show your work to receive credit!

(2) Please fill in all the above information and write your name on the top of each of the 4 exam pages.

(3) The point value on each problem appears to the left of the problem.

(4) You must show sufficient work to justify all answers. Correct answers with inconsistent work may not be given credit.

(5) No partial credit will be given on problems 1-3. Partial credit may be obtained on problems 4-8 provided sufficient work is shown.

(6) Circle the letter of the correct answer in problems 1-3, and write the answers to problems 4-8 in the space provided.

(7) No books or paper are allowed. Calculators may be used where appropriate.

(8) The exam is self-explanatory. Please do not ask the instructor to interpret any of the exam questions.

<table>
<thead>
<tr>
<th>Page 1</th>
<th>Points</th>
<th>Max Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Formula: \[ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \] if \( ax^2 + bx + c = 0 \)
Circle the correct answer to problems 1-3. You must show work to receive credit.

(8 pts) 1. Use the laws of exponents to simplify: \( \left( \frac{2}{x^3} \right) \left( \frac{1}{x^2} \right) = \)

A. \( x^{\frac{3}{5}} \)
B. \( x^{\frac{2}{6}} \)
C. \( x^{\frac{1}{6}} \)
D. \( x^{\frac{1}{3}} \)
E. \( x^{\frac{7}{6}} \)

(8 pts) 2. Find the function value \( v(-1) \) for \( v(t) = \frac{3t^3 - 2t^2}{t + 2} \).

A. 1
B. -2
C. \( \frac{5}{3} \)
D. -5
E. \( \frac{1}{3} \)

(8 pts) 3. Divide: \( (6x^3 - 11x^2 + 12x - 2) \div (2x - 5) = \)

A. \( 3x^2 + 2x + 1 + \frac{3}{2x - 5} \)
B. \( 3x^2 + 2x + 11 + \frac{53}{2x - 5} \)
C. \( 3x^2 - 13x + 38 + \frac{5}{2x - 5} \)
D. \( 6x^2 + 5x + 12 + \frac{2}{2x - 5} \)
E. None of the above
Name: ___________________________________________

Place your answers in the space provided. You must show your work to receive credit.

(24 pts) 4. Solve. Report radicals in simplest radical form. Do not use a calculator to approximate radicals.

(6 pts) a. \[ \sqrt{5x - 2} + 7 = 12 \]

\[ x = \]

(6 pts) b. \[ x^2 - 5x + 4 = 0 \]

\[ x = \]

(6 pts) c. \[ -8x + x^2 + 13 = 0 \]

\[ x = \]

(6 pts) d. \[ \frac{2}{x} + \frac{x}{x + 5} = \frac{25}{x^2 + 5x} \]

\[ x = \]
5. Perform the indicated operations and simplify.

a. \[ \frac{-3}{y + 4} + \frac{4}{y - 4} + \frac{y - 5}{y^2 - 16} \]

b. \[ 3 + \frac{x + 2}{x - 1} \]

6. Perform the indicated operations and simplify.

a. \[ \frac{y^2 + 8y + 16}{y^2 - 16} - \frac{y^2 - 2y - 8}{y^2 + 9y + 20} \]

b. \[ \frac{20x - 8}{x^2 - 9} \div \frac{2 - 5x}{x + 3} \]
Place your answers in the space provided. You must show your work to receive credit.

7. A picture frame, with uniform width, measures 10 cm by 30 cm, and 96 cm$^2$ of picture shows. Find the width of the frame. Draw a picture of the problem, name a variable, set up an equation and solve.

Width of frame =

8. Train A travels 6 miles per hour slower than Train B. Train A travels 279 miles in the same time that Train B travels 306 miles. Find the speed of each train. Name a variable, set up an equation and solve.

Speed of Train A =

Speed of Train B =