I. **Solve each system of equations.** (4 points each)

In problems 1 & 2, use the addition method or the substitution method.

1) \[
\begin{aligned}
2x - 2y &= -1 \\
12x + 11y &= 23
\end{aligned}
\]

2) \[
\begin{aligned}
x + 3y &= 8 \\
y &= 2x - 9
\end{aligned}
\]

3) Solve the system by graphing. Label the coordinates of the solution. (4 points)

\[
\begin{aligned}
x &= 3 \\
3y &= -2x + 6
\end{aligned}
\]

4) **Yes or No?** Determine whether the ordered pair \((3, -2)\) is a solution of the system: (3 points)

\[
\begin{aligned}
2x + y &= 4 \\
y &= 1 - x
\end{aligned}
\]
II. Perform the indicated operations for problems 5-17. Reduce all answers to lowest terms and write all answers without negative exponents. (2 points each)

5) \(4x^3\)

6) \(-3^0 + (-3)^0\)

7) \(\left(\frac{x^{-2}}{y^3}\right)^{-3}\)

8) \(\frac{3x^3y^2}{15x^2y^5}\)

9) \(\sqrt[4]{x^6y} \sqrt[3]{x^2y^5}\)

10) \(4\sqrt[3]{x-2} - 6\sqrt[4]{x+5}\)

11) \(\sqrt{x^2 - 7x - 1} \sqrt{x^2 + 1}\)
12) Evaluate the expression \(-x^2 + 5x - 1\) for
   \(a)\ x = -4\)  \(12a)___________\) (2 pts.)

   \(b)\ x = 4\)  \(12b)___________\) (2 pts.)

13) Find the product. \(0x + 9y, 0x - 9y\)  \(13)____________________\)

14) Find the product. \(y - 8\)  \(14)____________________\)

15) Find the product. \(-3x^2 - 3x - 4\)  \(15)____________________\)

16) Divide. \(\frac{-32x^3 + 16x^2 - 4x}{4x}\)  \(16)____________________\)
17) The area of a rectangle is \( (x^2 - 7x - 18) \text{ in}^2 \). Find the expressions that represent the length and width in terms of \( x \). \( A = LW \)

\[
A = (x^2 - 7x - 18) \text{ in}^2
\]

\[ W = \quad \text{ (1 pt.)} \]

\[ L = \quad \text{ (1 pt.)} \]

III. In problems 18 – 23, factor each expression completely. If an expression cannot be factored, state that it is prime. (2 points each)

18) \( 16ab + 4ac - 4b - c \)

19) \( 28 - 3x - x^2 \)

20) \( 9y^2 + 16 \)

21) \( 2x^2 - 7x - 4 \)

22) \( 5x^5 - 80x \)
23) \[ 2x^2 - 5xy - 3y^2 \]

IV. Solve these quadratic equations by the method of your choice. Express answers containing irrational square roots in simplified radical form or give the decimal equivalent rounded to the nearest thousandth, if necessary. (4 points each)

24) \[ x^2 + 7x = 18 \]

25) \[ 9x^2 = 64 \]

26) \[ 5x^2 - 8x - 3 = 0 \]

27) Use the Pythagorean Theorem to find the length of the diagonal of a piece of paper that measures 16 inches by 24 inches. Round answer to 2 decimal places if necessary. (3 points)

27) \[ \sqrt{24^2 + 16^2} \]
V. Solve the following word problems. (5 points each)

28) Two angles are supplementary angles when the sum of their measures is $180^\circ$. If angles $A$ and $B$ are supplementary angles, and Angle $A$ is five times as large as angle $B$, find the measure of each angle. Use systems of equations to solve.

28) Angle $A =$ ___________

Angle $B =$ ___________

29) The Meyers family had a family reunion in Texas. They purchased tickets to the Six Flags Amusement Park. The adult tickets each cost $40 and the children’s each cost $30. If 27 tickets were purchased at a total cost $930, how many adult tickets and children tickets were purchased?

29) Adult: _______________

Children: _______________

30) A photograph has a perimeter of 36 inches. The difference between the photograph’s length and width is 2 inches. Find the length and width of the photograph.

30) Length = _______________

Width = _______________

31) A hot-air balloonist accidentally dropped his camera overboard while traveling at a height of 6400 feet. The height $h$, in feet, of the camera $t$ seconds after being dropped is given by $h = -16t^2 + 6400$. In how many seconds will the camera hit the ground?

31) ____________________
Math 940 Practice Exams Answers:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>1)</td>
<td>(1,1)</td>
</tr>
<tr>
<td>2)</td>
<td>(5,1)</td>
</tr>
<tr>
<td>3)</td>
<td>(3,0)</td>
</tr>
<tr>
<td>4)</td>
<td>Yes</td>
</tr>
<tr>
<td>5)</td>
<td>-64x^5</td>
</tr>
<tr>
<td>6)</td>
<td>0</td>
</tr>
<tr>
<td>7)</td>
<td>8x^6y^9</td>
</tr>
<tr>
<td>8)</td>
<td>(\frac{x}{5y^3} ) or (\frac{1x}{5y^3} )</td>
</tr>
<tr>
<td>9)</td>
<td>14x^8y^6</td>
</tr>
<tr>
<td>10)</td>
<td>-2y-38</td>
</tr>
<tr>
<td>11)</td>
<td>2x^3-7x-2</td>
</tr>
</tbody>
</table>
| 12) | a) \(-37\)  
b) \(3\) |
| 13) | 100x^2-81y^2 |
| 14) | 16y^2-64y+64 |
| 15) | -3x^4+9x^3+12x^2 |
| 16) | -8x^2+4x-1 |
| 17) | a) \(W = x-9\)  
b) \(L = x+2\) |
| 18) | (4b+c)(4a-1) |
| 19) | -1(x-4)(x+7) |
| 20) | Prime |
| 21) | (2x+1)(x-4) |
| 22) | 5(x^2+4)(x+2)(x-2) |
| 23) | (2x+y)(x-3y) |
| 24) | x=2, x=-9 |
| 25) | x = \(\frac{8}{3}\) |
| 26) | x = \(\frac{4 \pm \sqrt{31}}{5}\) |
| 27) | C = 28.84 inches |
| 28) | a) Angle A = 150°  
b) Angle B = 30° |
| 29) | a) Adult: 12 tickets  
b) Children: 15 tickets |
| 30) | a) Length = 10 inches  
b) Width = 8 inches |
| 31) | t = 20 seconds |

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