Part I: Compute the following. Show all work for credit. 2 points each.

1) \( \frac{4}{7} + \frac{5}{2} \)  
2) \((1 - 7)^2\)  
3) \(-(-3)^3 + 8(2) - 1\)  
4) \(1^{-1} - 9^{-1}\)  
5) \(\frac{-0}{18}\)  
6) \(-|3| + |(-8)|\)  
7) \(\frac{60}{8} \times \frac{24}{5}\)  
8) \(32^{3/5}\)  
9) \(-\left(\frac{6}{10}\right)\)  
10) \(\left(\frac{4}{3}\right)^{-3}\)

Write your answers here:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>6)</td>
</tr>
<tr>
<td>2)</td>
<td>7)</td>
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<tr>
<td>3)</td>
<td>8)</td>
</tr>
<tr>
<td>4)</td>
<td>9)</td>
</tr>
<tr>
<td>5)</td>
<td>10)</td>
</tr>
</tbody>
</table>
Part II. You MUST show work for credit. 6 points each.

1. Complete the table.

<table>
<thead>
<tr>
<th>Inequality</th>
<th>Interval Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) $-12 \leq x &lt; -9$</td>
<td></td>
</tr>
<tr>
<td>b) $-\infty, -5$</td>
<td>$(−\infty, −5)$</td>
</tr>
<tr>
<td>c) $x \neq -8$</td>
<td></td>
</tr>
</tbody>
</table>

2. Solve the inequality. Give the solution set in both interval and graph forms.

$$\frac{4x+3}{-2} \leq 6$$

Graph solution:  

Interval notation:  

3. Solve for x.

a. $2(3 + 3x) = -11 + 15x$  

b. $\frac{7x}{9} = -5$
4. State the slope of the line.
   a. \( y = -6 \)  
   b. Through the points: (7,8) and (2,3)

Slope: __________

Slope: __________

5. State the intercepts and graph the line. **Label all intercepts.**

\[ 7x - 4y = 20 \]

x-intercept: __________

y-intercept: __________
6. Write the number in standard notation.
   a. $6.2 \times 10^4$
   b. $-3.5 \times 10^{-3}$

7. Write the expression with only positive exponents.
   Assume that all variables represent positive real numbers.
   \[
   \frac{3x^5 \cdot 2^{-3}}{(x^{-3})^3}
   \]

8. Factor completely:
   $3y^2 - 18y - 21$

9. Evaluate the following, given the function $f(x) = -x^3 + 3x - 5$.
   a. $f(-2)$
   b. $f(p^2)$
Part II. You MUST show work for credit.  8 points each

10. Simplify the rational expression and write your answer in lowest terms.
   a. \( \frac{x^2 - 25}{x^2 + 8x + 15} \)
   b. \( \frac{3n(n-6)}{-21n^2(n+6)} \)

11. Solve: \(-5x^2 - 8 = 41x\)

12. Factor completely, write prime if it cannot be factored.
   a. \( 3x^4 + 12x^3 + 15x^2 \)
   b. \( 1 - x^4 \)
13. Multiply and simplify your answer to lowest terms.

\[
\frac{4x - 20}{10x} \cdot \frac{5x^4}{20 - 4x}
\]

14. Choose a domain for each function. Write the correct number in the answer blank.

a) \[ f(x) = \frac{12}{x - 3} \]  Answer ________
   
   1) \((-\infty, \infty)\)
   2) \((0, \infty)\)
   3) \((9, \infty)\)
   4) \([3, \infty)\)
   5) \((-\infty, 3) \cup (3, \infty)\)
   6) Not listed.

b) \[ g(x) = \frac{x^2 - 9}{3} \]  Answer ________

   1) \((-\infty, \infty)\)
   2) \((0, \infty)\)
   3) \((9, \infty)\)
   4) \([3, \infty)\)
   5) \((-\infty, 3) \cup (3, \infty)\)
   6) Not listed.

c) \[ h(x) = \sqrt{x - 3} \]  Answer ________

15. Find the equation of the line passing through \((1, -2)\) with slope \(-8\).

\[
\text{The point slope form is } \Rightarrow (y - \ ) = (x - \).
\]

\[
\text{The slope intercept form is } \Rightarrow y = \ x + \,.
\]
16. Express in simplified form. Assume that all variables represent positive real numbers.

a. \( \sqrt{\frac{25a^6}{81b^{10}}} \)

b. \( 3\sqrt{12} + 7\sqrt{36} - 5\sqrt{48} \)

17. Perform the indicated operation on radical expressions.

c. Distribute and simplify.
\( \sqrt{3}(6 - \sqrt{32}) \)

d. Rationalize the denominator.
\( \frac{2\sqrt{10}}{\sqrt{12}} \)
18. Complete the table and graph the function.

\[ f(x) = (-x)^2 - 2 \]

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

19. Use the quadratic formula to solve for \( x \).

\[ 2x^2 + 5x - 3 = 0 \]
20. Solve for $x$. Be sure to check your answer.

$$\sqrt{3x + 6} + 4 = x$$

21. Find the quotient and remainder in the division of $4x^2 + 5x - 18$ by $x - 3$.

Quotient: __________________________ Remainder: ____________
Part IV. Choose 3 of the following 5 problems.

You must indicate the 3 problems to be graded. If not, I will grade the first three.

You MUST show work for credit. 10 points each.

☐ 22. Given the function \( f(x) = \sqrt{4 - 3x} \), fill in the table, graph the function, and state the domain and range in interval notation.

<table>
<thead>
<tr>
<th>( x )</th>
<th>( f(x) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td></td>
</tr>
<tr>
<td>-7</td>
<td></td>
</tr>
<tr>
<td>4/3</td>
<td></td>
</tr>
</tbody>
</table>

Domain: __________

Range: __________

☐ 23. Solve for \( x \).

\[
1 - \frac{8}{x+5} - \frac{40}{x^2+5x} = 0
\]
24. Given the function \( f(x) = \frac{-3}{x-1} \), fill in the table, graph the function, and state the equation of the vertical and horizontal asymptote. Plot additional points, if necessary, for you to sketch the shape of the graph. Label your points and asymptotes in the graph.

<table>
<thead>
<tr>
<th>( x )</th>
<th>( f(x) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5</td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Horizontal Asymptote: __________

Vertical Asymptote: __________

25. How many gallons of 40% antifreeze must be mixed with 10 gallons of 70% solution to get a 50% solution? Set up and solve the equation.
26. Find the measure of the following angles:

BE SURE YOU HAVE MARKED THE PROBLEMS TO BE GRADED!