Part I. Show all work for possible partial credit. 5 points each.

1. Solve the equation for x. \(3x - 2(1 - x) = -8\)

2. Solve the inequality.

\[-2x - 5 \leq 7\]

Graph solution:

3. Graph the given line. Label all intercepts.

\[
\frac{1}{3}x - 2y = -4
\]
4. Given the graph of the line
   a) find the slope of the line.
   
   b) write the equation of the line.

5. Find the product: \((2x^2 - 5)^2\)

6. Simplify using only positive exponents. Assume all variables represent positive real numbers.
   \[3x^{-4}(5x^3)^2\]

7. Simplify the expression:
   \[3 - \frac{2}{5} \left( -\frac{3}{4} \right)\]

8. Find the quotient and remainder.
   \[x + 2 \div x^3 - 2x^2 + 5x - 4\]
For problems 9-12, factor completely:

9. \( 4x^2 - 25 \)  
10. \( x^2 - 7x + 10 \)

11. \( 2x^2 + 19x - 10 \)  
12. \( 2x^2 - 6x - 20 \)

13. Given \( f(x) = 3x - x^2 \), evaluate

   a) \( f\left(\frac{1}{3}\right) \)  
   b) \( f(-2) \)

14. Solve for \( x \): \( \sqrt{7x - 24} = 2\sqrt{x} \)

15. Given \( C = \frac{5}{9}(F - 32) \), solve for \( F \)
16. Carry out the indicated operation and express in simplest form. Assume that all variables represent positive real numbers.

a) $\sqrt{50a^4b^6}$

b) $2\sqrt{20} + \sqrt{45}$

**Part II. Show all work for possible partial credit. 8 points each**

17. Solve for $x$. 
\[
\frac{2x + 5}{3} - \frac{x - 2}{4} = 2
\]

18. Indicate with a $\checkmark$ whether 3 is in the domain of each function.

<table>
<thead>
<tr>
<th>Function</th>
<th>3 is in domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f(x) = (x - 3)(x + 2)$</td>
<td>□</td>
</tr>
<tr>
<td>$g(x) = \sqrt{x + 2}$</td>
<td>□</td>
</tr>
<tr>
<td>$h(x) = \sqrt{x - 4}$</td>
<td>□</td>
</tr>
<tr>
<td>$m(x) = \frac{2}{x - 3}$</td>
<td>□</td>
</tr>
</tbody>
</table>
19. Find the equation of the line passing through \((-2, 4)\) with slope 5.

The standard form of the equation is \(\Rightarrow \quad \underline{x} + \underline{y} = \underline{5} \).

The slope intercept form is \(\Rightarrow y = \underline{1} \underline{x} + \underline{5} \).

20. For the following pair of functions, find the following. Be sure to express in simplest form.
\[ f(x) = 4x^2 - 5 \quad \text{and} \quad g(x) = -2x^2 + x + 7 \]

a) \((f + g)(3) = \) 

b) \((f - g)(x) = \)

21. Graph the function by creating a table of ordered pairs. Label all intercepts.
\[ f(x) = 4 - x^2 \]
22. Complete the following table.

<table>
<thead>
<tr>
<th>Inequality</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) $x \leq -2$</td>
<td></td>
</tr>
<tr>
<td>b) $(-\infty,0)$</td>
<td></td>
</tr>
<tr>
<td>c) $1 &lt; x \leq 5$</td>
<td></td>
</tr>
<tr>
<td>d) $x \neq 4$</td>
<td></td>
</tr>
</tbody>
</table>

23. Express in simplest form: \[ \frac{x^2 - 4x}{x^2 - 5x + 4} \]

24. For problems 24 and 25, perform indicated operation. Simplify.

24. $\frac{2x - 6}{4x^2} \div (x - 3)$

25. $\frac{3}{x - 2} + \frac{5}{x - 2} - \frac{x}{x^2 - 4}$
26. Solve for $x$.

   a) $3x^2 - 30 = 0$
   
   b) $-(2x - 5)(x + 3) = 0$

27. Solve for $x$. $(x - 2)(x + 1) = 10$

28. Solve for $x$. $x^2 + 4x - 2 = 0$
Part II. Choose 3 of the following 5 problems. You must indicate the 3 problems to be graded. If not, we will grade the first three. Show all work for possible partial credit. 8 points each.

☐ 29. Solve for $x$. \[ \frac{2}{x} - \frac{35}{x^2} = 0 \]
Grade

☐ 30. Solve for $x$. \[ x^4 - 14x^2 + 45 = 0 \]
Grade

☐ 31. Find the measure of each angle in the given triangle.
Grade All measures are expressed in terms of degrees.

\[ \angle A = \ldots \]
\[ \angle B = \ldots \]
\[ \angle C = \ldots \]
32. Given the right triangle with sides labeled,
   a) using the Pythagorean Theorem, write an equation in terms of \( x \).
   
   b) Solve the equation. Find the lengths of all three sides.

33. Graph the function \( f(x) = -\frac{1}{x} \). Label at least 5 points.