### Part I. Show all work for possible partial credit. 2 points each

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>$\frac{-12}{3} = \frac{3}{5}$</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$\frac{-3}{4} \div \left(\frac{-17}{8}\right) = \frac{21}{3}$</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$-\left</td>
<td>-3-5\right</td>
</tr>
<tr>
<td>4</td>
<td>$\frac{1}{3} + 2 - \frac{5}{2} = \frac{1}{3}$</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>$16 \div 4 - 2 \cdot 3^2 = \frac{1}{3}$</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>$-3^2$</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>$\frac{21}{2} \times \frac{4}{3} = 7$</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>$4^0 = 1$</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>$12.9 + 1.01 = 13.91$</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>$21 \cdot 0 \cdot (514) = 0$</td>
<td></td>
</tr>
</tbody>
</table>
Part II. Show all work for possible partial credit. 5 points each.

11. Solve the equation for \( x \).
\[-5x = 3(2 + 3x) - 6\]

12. Solve the inequality. Give the solution set in both interval and graph forms.
\[-\frac{2}{3}x \geq 6\]
Graph solution:

Interval notation

13. Graph the given line. Label all intercepts.
\[-2x + 4y = 8\]
14. Graph the line that has a $y$-intercept of $(0,4)$ and a slope of $\frac{2}{3}$.

15. Find the product and simplify: $(x - \sqrt{y})(x + \sqrt{y})$

16. **Simplify** the expression: \[
\frac{1}{3} - \frac{5}{6x} + \left(\frac{2}{3x}\right)
\]

17. Simplify using **only positive exponents**. Assume all variables represent positive real numbers.
\[
\frac{2x^3 \cdot 3^{-2}}{(x^{-2})^3}
\]

18. Factor completely, write “prime” if it cannot factor: $3y^2 - 11y - 20$. 
19. $2x^3 - 50x$

20. $2a^3 + a^2 - 14a - 7$

21. Express and simplify in lowest terms: \[ \frac{x - 3}{x^2 - x + 6} \]

22. Solve: $x^2 - 64 = 0$.

23. Find the slope of the line through the points (2, -1) and (-3, 4).

24. Given $C = \frac{5}{9}(F - 32)$, solve for $F$. 
25. For the given right triangle, find $x$. You must set up and solve an equation for credit.

![Right triangle diagram]

Part III. Show all work for possible partial credit. 7 points each

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

27. Multiply and simplify: 
\[
\frac{4x - 20}{5x} \cdot \frac{4x^4}{10 - 2x}
\]
28. Choose a domain for each function. Write the correct number in the answer blank.
   a) \( f(x) = \frac{4}{x - 3} \) Answer ________
      1) \((-\infty, \infty)\)
      2) \((0, \infty)\)
      3) \((9, \infty)\)
   b) \( g(x) = \sqrt{x - 3} \) Answer ________
      4) \([3, \infty)\)
      5) \((-\infty, 3) \cup (3, \infty)\)
   c) \( h(x) = \sqrt{x - 3} \) Answer ________
      6) Not listed.

29. Find the equation of the line passing through \((2, -1)\) with slope \(-5\).

   The point slope form is \( (y - \_\_\_) = \_\_\_ (x - \_\_). \)

   The slope intercept form is \( y = \_\_\_ x + \_\_\_. \)

30. For the following pair of functions, find the following. Be sure to express in simplest form.

   \( f(x) = 4x + 3 \) and \( g(x) = -2x^2 + 2x + 6 \)

   (a) \( (f + g)(2) = \)
   (b) \( (f - g)(x) = \)

31. Perform the indicated operation. **Reduce** to lowest terms.

   \( \frac{3}{x-2} - \frac{4}{x^2-2x} \)
32. Express the radical in simplified form. Assume that all variables represent positive real numbers.

a) \( \sqrt[3]{\frac{25a^6}{81b^{10}}} \)

b) \( 2\sqrt{24} + \sqrt{54} \)

33. Graph the function by creating a table of ordered pairs:

\( f(x) = x^2 + 1 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>–3</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>3</td>
<td></td>
</tr>
</tbody>
</table>

34. Complete the following table.

<table>
<thead>
<tr>
<th>Inequality(set)</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) ( x \geq 5 )</td>
<td></td>
</tr>
<tr>
<td>b) _________</td>
<td>((-\infty, 2))</td>
</tr>
<tr>
<td>c) (-3 &lt; x \leq 1)</td>
<td></td>
</tr>
<tr>
<td>d) ( x \neq 2 )</td>
<td></td>
</tr>
</tbody>
</table>
35. Solve for $x$.  
\[ x^3 - 14x^2 + 45x = 0 \]

36. Solve for $p$ and check.  
\[ \sqrt{p} = p - 2 \]

37. Given $f(x) = x^2 - 3x + 2$, evaluate

a) $f(-2)$  
b) $f(3d)$
Part IV. 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. 7 points each.

☐ 38. Solve for $x$ and simplify answers. $x^2 - 3x = 6$
Grade

☐ 39. Factor completely: $1 - x^8$
Grade

☐ 40. How many gallons of 30% antifreeze must be mixed with 10 gallons of 70% solution to get a 50% solution?
Grade
41. The base of a parallelogram is 5 feet more than the height. If the area of the parallelogram is 36 ft.², what are the measures of the base and height?

SET UP AN SOLVE AN EQUATION FOR CREDIT!
area of parallelogram = base times height

42. Graph the function \( f(x) = \frac{2}{x} \). Label at least 5 pts.