Show Work!

1. Use order of operations to simplify.
\[
\frac{4[-3+(6)^2+2]}{6-2(3-6)} = \frac{4[-3+36+2]}{6-2(-3)} = \frac{4[35]}{12} = \frac{60}{12} = 5
\]

2. Write the set using (a) interval notation and (b) graph.
   \(\{x | x \leq -3\}\)
   
   a. \((-\infty, -3]\)
   
   b. 
   \[\text{Graphical representation}\]
   
   2 points

3. Identify the property that justifies the statements?
   
   A. Identity property  
   B. Associative property  
   C. Commutative property  
   D. Distributive property  
   E. Multiplication Property of Zero

   a. \(6(5 + x) = 6(x + 5)\)
   
   b. \(-4 + 0 = -4\)

   a. \(C\)
   
   b. \(A\)

4. Solve the equation.
\[
\frac{3x-1}{2} = \frac{x+2}{5} + 3
\]
\[
10\left[\frac{3x-1}{2}\right] = 10\left[\frac{x+2}{5}\right] + 10(3)
\]
\[
5(3x-1) = 2(x+2) + 30 \Rightarrow 15x - 5 = 2x + 4 + 30
\]
\[
13x = 39
\]
\[
x = 3
\]

5. a.) Solve the equation and give the solution set.  
   b.) Identify the equation as a conditional, an identity, or a contradiction.

   \(4x - 3(5 - 2x) = 6(x - 3) + 2x + 1\)

   a. \(\frac{2-17}{3}\)

   b. \(\text{Conditional}\)

   3 points

   2 points

   \[aX = -2\]
   
   \[x = -1\]
6. Solve the formula.
\[ B = cx + a \text{ for } c. \]
\[ \frac{B - a}{x} = c. \]

7. To make a profit, a baker's sales of cookies must be greater than her costs to make them. The baker sells cookies at a price of $2 that cost her $1.50 to make. She also has basic costs of $5 on each batch of cookies. How many cookies must she sell in a batch in order to make a profit. Write an inequality and solve.

Sales > Cost \quad \chi = \text{number of cookies} \quad \text{more than 10}

\[ 2\chi > 1.50\chi + 5 \]
\[ 0.50\chi > 5 \]
\[ \chi > \frac{5}{0.50} \]
\[ \chi > 10 \]

8. a. Solve the inequality. Give the solution set in interval and graph forms. (3 points)

-5 < 2x + 1 < 4

\[ -4 < 2x < 3 \]
\[ -2 < x < \frac{3}{2} \]

b. \( (-3, \frac{3}{2}) \)  

2 points

c. 

2 points

9. For the compound inequality, a. solve and give the solution set in interval form and graph form. (3 points)

\[ 3+2x \leq 11 \text{ or } x - 4 \geq 3 \]
\[ 2x \leq 8 \quad x \geq 7 \]
\[ x \leq 4 \]

b. \( (-\infty, 4] \cup [7, \infty) \)  

2 points

c. 

2 points

10. Let \( A = \{0, 2\} \quad B = \{1, 2, 3, 4\} \) and \( C = \{3, 4\} \).

a. Find. \( B \cup C \)

\[ 2 \]

2 points

b. Find \( A \cap C \)

\[ \emptyset \]

2 points
11. a. Complete the table of ordered pairs for the equation $3x - 2y = 9$.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>$\frac{3}{2}$</td>
</tr>
<tr>
<td>-3</td>
<td>-6</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

4 points

b. Graph the equation. (4 points)

12. If two points are on the same horizontal line, they have the same $y$ coordinate.

13. a. Find the slope of the line $2x + 3y = 15$.

$$3y = -2x + 15$$
$$y = -\frac{2}{3}x + 5$$

slope: $-\frac{2}{3}$

2 points

b. Find the $y$-intercept.

$y$-intercept: $(0, 5)$

2 points

c. Graph the equation.

(4 points)
14. Find the equation in standard form of the line through the points \((1, 5)\) and \((2, 4)\).

\[
\frac{y - 5}{2 - 5} = \frac{x - 1}{2 - 1}
\]

\[
m = \frac{2 - 5}{2 - 1} = -3
\]

\[
y = -3x + 8
\]

15. Write the equation of the line perpendicular to \(y = 4\), through \((2, 5)\).

\[
x + y = 4
\]

16. Graph the inequality \(3x + 4y > 12\).

17. Explain why or why not the relation is a function. Given the domain and range:

\[
R = \{(3, 2), (5, 5), (-6, 2), (2, 3)\}
\]

a. It is a function because for each domain value, there is exactly one corresponding range value.

b. Domain: \(-6, 2, 3, 5\)

c. Range: \(3, 2, 5, 2\)
18. For \( f(x) = 3 - 4x \), find:
   a. \( f(-2) = 3 - 4(-2) = 3 + 8 = 11 \)
      \[ \text{11} \]
      \[ \text{2 points} \]
   b. \( f(3b) = 3 - 4(3b) = 3 - 12b \)
      \[ 3-12b \]
      \[ 2 points \]
   c. \( f(x-1) = 3 - 4(x-1) = 3 - 4x + 4 = 7 - 4x \)
      \[ 7-4x \]
      \[ 2 points \]

19. Solve the system by substitution or elimination and write the solution in the form \( (x, y) \).

\[
\begin{align*}
2x + 3y &= -8 \\
x - 2y &= -4 \\\\end{align*}
\]

\[
\begin{align*}
2x + 3y &= -8 \\
-2x + 4y &= 8 \\
7y &= 0 \\
y &= 0
\end{align*}
\]

\[ (-4, 0) \]

\[ 3 \text{ points} \]

20. Select variables to represent the two unknowns, write two equations using the two variables, and solve the resulting system.

A woman wishes to invest \$8000 in two accounts. One account earns 4% interest and the other earns 7.5% interest. The interest for the first year needs to be \$425. How much should she invest in each account?

\[ x = \text{amount at 4% interest} \]

\[ y = \text{amount at 7.5% interest} \]

\[ x + y = 8000 \]

\[ 0.04x + 0.075y = 425 \]

\[ -4x - 4y = -32000 \]

\[ 4x + 7.5y = 42500 \]

\[ 3.5y = 10500 \]

\[ y = \frac{10500}{3.5} \]

\[ y = 3000 \]

\[ x = 8000 - 3000 = 5000 \]