Show all your work to get full/ partial credit. Each problem is worth 5 points.

1. Graph the set \( \{ x \mid -2 \leq x < 4 \} \) and express in interval notation.

2. Simplify the expression:
\[
\frac{|7-|4-6|+(5-2)^2|}{\sqrt{4^2-12}}
\]

3. Simplify:
\[
6-2[(3x+2y)-(4x-y)] + 11
\]

Simplify and write the answer with positive exponents only

4. \((x^3y^2)^{-2}(3x^2y^{-2})^3\)

5. \(\left(\frac{1}{2} - \frac{1}{3} + \frac{1}{6}\right)^{-2}\)
6. Write the following numbers in scientific notation.
   a. 0.00026  
   b. 520,000,000

7. Simplify: \( \sqrt[3]{x^2 y^4} \cdot \sqrt[3]{x^4 y^5} \)

8. [2.5 points for each] Given the polynomial: \( 3w^2 - 4w^3 + w - 2, \)
   (a) What is the leading term?  
   (b) What is the degree?

9. Expand \((3x - 2y)^2\)

10. Completely factor the polynomials.
    (a) \(6ab + 9b + 14a + 21\)  
    (b) \(x^2 + 8x + 16\)

11. (a) Simplify: \( \frac{x^2 - 4}{x^2 - 5x - 14} \)  
    (b) And, state any restrictions on the variable \(x\).

12. Simplify and rationalize the denominator: \( \frac{\sqrt{4}}{\sqrt{9y}} \)
13. A contractor must tile a rectangular room that is 3 ft longer than it is wide, and the perimeter of the room is 34 ft. Find the dimensions of the room.

14. Solve \( 8 = 3x + kx \) for \( x \).

15. Solve the equation: \( \frac{x+3}{4} - \frac{x+2}{5} = \frac{x+1}{10} \)

16. Simplify the complex fraction: \( \frac{1}{4x+2} + \frac{1}{1+\frac{1}{2x}} \)

17. Identify the following equation as conditional, contradiction, or identity.
\[
2(3 - 7w) + 3 = 2w + 9 - 16w
\]