1. Simplify: \( \frac{x^0 y^4 z^{-6}}{x^3 y^4 z^3} \)

1. \( \frac{1}{x^3 y^4 z^3} \) (3)

2. Solve the equation: \( \frac{1}{12} (4x + 11) = \frac{1}{4} (2x + 1) \)

2. \( x = 1 \) (3)

3. Solve for \( m \): \( K = \frac{ma}{F} \)

3. \( m = \frac{KF}{a} \) (3)

4. Expand: \( (2x + 5y)^2 \)

4. \( 4x^2 + 20xy + 25y^2 \) (3)

5. Use the square root properly to solve \( 2x^2 - 90 = 0 \). Leave your answer in simplified radical form.

5. \( x = \pm \sqrt{45} \) (3)

6. Subtract: \( \frac{4w-18}{3w-9} - \frac{w-5}{w-3} \)

6. \( \frac{w^2 - 14w + 45}{3w^2 - 27} \) (3)
7. Simplify: \( \frac{-6 \pm \sqrt{90}}{9} \)

8. Solve: \( \sqrt{3t - 7} = 4 \)

9. Divide: \( \frac{20x^7 - 4x^3}{-4x^3} \)

10. Solve: \( 3^{3x+8} = 81 \)

11. Graph the equation \( 2x - 3y = 12 \)

12. Factor completely: \( 3x^2 - 3x - 60 \)
13. Factor completely: $12x^2y + 3xy^2 - 28x - 7y$

14. Solve by factoring: $3x^3 - 9x^2 - 84x = 0$

15. Solve: $\frac{x+5}{x} + \frac{3}{4} = \frac{1}{2}$

16. Solve the following system of linear equations algebraically. Show work for full credit. Write your answer as an ordered pair.

   $7x + 2y = -1$
   $3x - 4y = 19$

17. Divide: $\frac{4x+8}{36-12x} \div \frac{8x+40}{6x-18}$

18. Subtract: $\sqrt{175} - \sqrt{252}$
19. Bill needs a score of at least 85 on the final exam. 
   a. Write the phrase as an inequality. Let the $x$ represent Bill’s score.

   19a. __________________________ (1)

   b. Graph the inequality on the number line.

   

20. Evaluate the expression and write in the inequality:

   $-(2)^3$  
   $-(-2)^3$  

   ___________________  ___________________  ___________________  inequality (3)

21. Find the value of $x$.

   

22. A 7 foot tree casts a 4 foot shadow. A lamp post casts a 28 foot shadow. What is the height of the lamp post?

   

   22. __________________________ feet (3)
23. A movie theater charges $7.00 for an adult ticket and $3.50 for a child’s ticket. When the Avengers End Game movie came out, 500 tickets were sold for a total revenue of $2,450. How many of each ticket was sold? Write a system of equations to solve this, using A (adults) and C (children). You do not need to solve the system.

Equation 1

Equation 2

24. Use the quadratic formula \( x = \frac{-b\pm\sqrt{b^2-4ac}}{2a} \) to solve the equation

\[ 3x^2 - 4x = 2 \]

for \( x \). Round your answers to the nearest hundredth.

\[ 24. \ x = \quad \ x = \quad (4) \]

25. McDonalds has about 320,000 managers and each makes on average $41,000 per year. How much money does McDonalds spend on manager’s salary expense each year? Put both numbers in scientific notation first and leave your answer in scientific notation.

\[ 25. \quad (\quad) \quad (\quad) \quad (4) \]

26. Write \( \sqrt[3]{D} \) using an exponent, without a radical

\[ 26. \quad (\quad) \quad (2) \]
27. Use the equation \( y = -x^2 + 2x + 3 \) to:
   
   a) Find the \( x \) – intercepts. Write your answers as ordered pairs.
   
   \( (\ , \ ) \) and \( (\ , \ ) \)  \( 3 \)  
   
   b) Find the \( y \) – intercept. Write your answer as an ordered pair.
   
   \( (\ , \ ) \)  \( 3 \)  
   
   c) Find the vertex. Write your answer as an ordered pair.
   
   \( (\ , \ ) \)  \( 3 \)  
   
   d) Using your answers from above, draw a graph of the parabola. \( 2 \)  

28. Tristan has \$30 saved. He earns \$15 each week delivering papers.

   a. Write an equation to show Tristan’s savings \( (y) \) after \( x \) weeks.

   \[ 28a. \text{ } \]  \( 2 \)  

   b. What is the slope of the equation? (include units)

   \[ 28b. \text{ } \]  \( 3 \)  

   c. Write a sentence to interpret the slope in the context of this problem.

   \[ \text{ } \]  \( 3 \)  

   d. Tristan needs to have \$345 to buy a new bike. After how many weeks will Tristan be able to afford the new bike?

   \[ 28d. \text{ } \]  \( 2 \)