1) Solve \( \frac{12}{7}r - \frac{1}{21}r = r - \frac{10}{3} \)

2) Solve \( \frac{1}{3}(x + 3) + \frac{5}{6}(x - 4) = x - 2 \).

3) Solve \( 12(x + 3) = 6(2x - 4) + 60 \).

4) Solve the inequality, graph the solution and express the solution in interval notation. \(-3(3a + 6) < -12a - 27\)

5) Solve the absolute value equation \( |8x - 6| = 2 \).

6) Solve \( |5f - 3| = -6 \).

7) Solve and graph the solution set : \( |8x - 4| \geq 8 \)

8) Solve the absolute value inequality and write the solution in interval notation \( |12k + 4| + 8 < 15 \).

9) Solve the formula \( V = \frac{1}{3}Bh \) for \( B \).

10) Solve the formula \( A = \frac{1}{2}h(b_1 + b_2) \) for \( b_1 \).

11) Find \( f(-4) \) when \( f(x) = 4x^2 + 5x + 5 \).

12) Is the graph shown below the graph of a function?

13) Rewrite the function \( 5x - 6y = 5 \) using function notation. Let \( x \) be the independent variable and \( y \) be the dependent variable. Then, use the letter \( f \) to name the function.
14) Find the slope of the line containing \((-8, -6)\) and \((-4, 4)\).

15) Graph \(3x - y = 6\) in a rectangular coordinate system.

16) Graph \(y + 2 = 0\) in a rectangular coordinate system.

17) Graph \(x = -4\) in a rectangular coordinate system.

18) Write the equation in slope-intercept form of the line with slope \(m = \frac{1}{2}\) that passes through \((-8, -5)\).
19) Extract needed information from the graph to write an equation in **slope-intercept form** of this line.

20) Determine whether the two lines are parallel, perpendicular or coinciding.

\[ 12x + 4y = 16 \quad \text{and} \quad 15x + 5y = 21 \]

21) Solve the system of equations by graphing

\[
\begin{align*}
  y &= -2x + 1 \\
  x + 2y &= -4
\end{align*}
\]

22) Solve the system of equations by the **substitution method**.

\[
\begin{align*}
  x + 9y &= -19 \\
  -5x + 8y &= -64
\end{align*}
\]

23) Solve the system by the **elimination method**.

\[
\begin{align*}
  -5x + 29 &= 6y \\
  -2x + 3y &= -17
\end{align*}
\]
24) Graph the system of linear inequalities.
\[
\begin{align*}
3x - 2y & \geq -6 \\
x - 1 & < 0
\end{align*}
\]

25) First, write a system of equations for this word problem. Then, solve the system to answer the question.
The manager of a candy shop sells chocolate covered nuts for $5 per pound and chocolate covered raisins for $11 per pound. The manager wishes to make a 60-pound cashew-peanut mixture that will sell for $9 per pound. How many pounds of each should be used?

26) First, write a system of equations for this word problem. Then, solve the system to answer the question.
A rectangular Persian carpet has a perimeter of 224 inches. The length of the carpet is 30 inches more than the width. What are the dimensions (length and width) of the carpet?

27) Simplify \((x^7y^{-6}z^{-4})(x^{-2}y^{-4}z^{8})\). Use positive exponents only in the answer.

28) Simplify \((2m^2n^{-5})^3\). Use positive exponents only in the answer.

29) Simplify \((3m^{-6}n^{-3})(4m^3n^{-7})^{-2}\). Use positive exponents only in the answer.

30) Subtract. \((4n + 5n^5 + 8n^2) - (-20n^2 + 3n^5 - 6n)\)

31) Multiply and simplify. \(-10x^6(7x^6 + 3x^3)\).

32) Multiply and simplify. \((x - 4)(7x^2 + x + 8)\).

33) Simplify \((4a - 7)^2\).

34) Perform the division. \[
\frac{8m^9n - 4m^8n^7 + 6m^7n^9}{2m^6n}
\]

35) Divide using long division. \((9m^2 + 65m - 56) ÷ (m + 8)\)

36) Divide using long division. \((2x^3 + x^2 - 3x + 2) ÷ (x + 3)\)
1) \([-5]\)
2) \([2]\)
3) \([\text{All real numbers}]\)
4) \((\infty, -3)\)
5) \(\left\{\frac{1}{2}, 1\right\}\)
6) \(\emptyset\)
7) \(\left(-\infty, -\frac{1}{2}\right) \cup \left[\frac{3}{2}, \infty\right)\)
8) \(\left\{-\frac{11}{2}, \frac{3}{2}\right\}\)
9) \(B = \frac{3V}{h}\)
10) \(b_1 = \frac{2A - (h)(b_2)}{h}\)
11) 49
12) Not a function
13) \(f(x) = \frac{5 - 5x}{-6}\)
14) \(\frac{5}{2}\)
16) \[ y = x - 10 \]

17) \[ y = x - 5 \]

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

19) \[ y = x - 5 \]

20) Parallel

21) \{(2, -3)\}

22) \{(8, -3)\}

23) \{(7, -1)\}

24) \[ x^2 + y^2 = 25 \]

25) Nuts: 20 lb; raisins: 40 lb

26) 41 inches by 71 inches

27) \[ \frac{x^5 z^4}{y^{10}} \]
Answer Key
Testname: ONLINE MAT 1033 MIDTERM REVIEW

28) \( \frac{8m^6}{n^{15}} \)

29) \( \frac{27n^5}{16m^4} \)

30) \( 2n^5 + 28n^2 + 10n \)

31) \( -70x^{12} - 30x^9 \)

32) \( 7x^3 - 27x^2 + 4x - 32 \)

33) \( 16a^2 - 56a + 49 \)

34) \( 4m^3 - 2m^2n^6 + 3mn^8 \)

35) \( 9m - 7 \)

36) \( 2x^2 - 5x + 12 + \frac{-34}{x + 3} \)