1) Find the **SUM** of the solutions of the equation.
\[8x^2 + 40x = 16x\]

Use the quadratic formula to solve the equation. (All solutions are real numbers.)

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

Choose the equation that matches the graph.

3) ![Graph](image)

A) \[f(x) = x^2 - 2x - 5\]
B) \[f(x) = -x^2 + 2x - 5\]
C) \[f(x) = x^2 + 2x + 5\]
D) \[f(x) = x^2 + 2x - 5\]

Use the square root property to solve the equation.

4) \[y^2 = 12\]

5) \[(x - 17)^2 = 81\]

6) Find the **SUM** of the solutions of the following *quadratic equation*: \[x^2 + 9x - 36\]

Find the product.

7) \[(5a - 8b)(-7a - 6b)\]

8) \[(4x + 7y)^2\]

9) \[(x - 2)(x^2 + 2x + 4)\]

10) \[(3a + 5c)(3a - 5c)\]

Factor by grouping.

11) \[x^3 + 5x^2 + 6x + 30\]

12) \[32r^2 + 12ry - 8xr - 3xy\]

Perform the indicated operation.

13) \[x - 5 \div x^2 - 3x - 10\]

14) Perform the long division to find the remainder.
\[
\frac{5x + 3}{10x^2 + 1x + 9}
\]

Simplify the complex fraction.

15) \[\frac{9 + \frac{3}{x}}{\frac{x}{4} + \frac{1}{12}}\]

Find the domain of the function.

16) \[f(x) = \frac{-7x}{x - 5}\]

17) \[f(x) = \sqrt{20 - x}\]

Factor the trinomial.

18) \[x^2 - x - 90\]

Factor.

19) \[6z^2 + 5z - 6\]

Factor completely.

20) One of the factors of \[u^2 - 3u - 40\] is
Factor completely.
21) $30x^2 + 25x + 12x + 10$

Factor completely.
22) $3x^3 + 9x^2 - 30x$

Factor completely.
23) $x^3 - 343$

Solve the problem.
24) The product of two consecutive negative integers is 89 more than their sum. Find the larger integer.

25) The length of a rectangular storage room is 3 feet longer than its width. If the area of the room is 40 square feet, find its dimensions.

Give the quadrant in which the point is located.
26) $(5, -11)$

27) Find the slope of the line through $(-4, 4)$ and $(2, 6)$.

Find the slope and the $y$-intercept of the line.
28) $-4x + 8y = 8$

Graph the following line.
29) Through $(0, 6), m = \frac{1}{5}$

Express the rational expression in lowest terms.
32) $\frac{y^2 + 3y - 10}{y^2 + 4y - 12}$

Solve the equation.
33) $4(2z - 4) = 7(z + 3)$

Solve the equation for the specified variable.
34) $9k + ar = r - 6y$ for $r$

Solve the formula for the specified variable.
35) $I = \frac{nE}{nr + R}$ for $n$

36) Simplify by reducing to lowest terms:
$\frac{x^2 + 4x + 4}{x^3 + 8}$

Perform the indicated operation and simplify.
37) $\frac{6p - 6}{p} \cdot \frac{6p^2}{8p - 8}$

Simplify the complex fraction.
38) $\frac{9 + \frac{3}{s}}{\frac{s}{4} + \frac{1}{12}}$

Simplify.
39) $\frac{4}{4r - 1} - 4$

Solve by system to find the $x$ value of the solution.
40) $2x + 3y = 4$
$-4x - 6y = 8$

Solve the absolute value equation or indicate that the equation has no solution.
41) $16x + 4| + 8 = 13$

Evaluate the function.
42) $f(x) = x - 8$ Find $f(-1)$

43) $f(x) = 5x^2 + 4x + 8$ Find $f(4)$
Solve the equation. Be sure to check your proposed solution by substituting it for the variable in the given equation.

44) \(8y - 3 = -2 + 4y\)

Solve the equation.

45) \(\frac{2}{5} - \frac{1}{3} = \frac{4}{x}\)

46) \(\frac{x}{2} - \frac{3}{2} = \frac{7x}{4}\)

Express using positive exponents. Then simplify.

47) \(\left(\frac{1}{3}\right)^{-3}\)

Simplify the expression. Write your answer with only positive exponents.

48) \((-3x^9)(-2x^4)\)

49) Simplify: \(\left(\frac{81}{64}\right)^{-\frac{3}{2}}\)

Perform the indicated operation. Give the result in standard form.

50) \(\frac{6 + 4i}{5 - 6i}\)

51) \(\frac{2 + 3i}{5 + 6i}\)

Solve and graph.

52) \(7z + 1 > 6z + 7\)

53) \(-6c + 7 \leq -7c + 13\)

Simplify. Assume that all variables represent positive real numbers.

54) \(\sqrt{162} - 5\sqrt{72} - 5\sqrt{128}\)

55) \(\sqrt{6} + 6\sqrt{96} + 4\sqrt{216}\)

Find the x- and y-intercepts for the equation. Then graph the equation.

57) \(2x - 4y = 4\)

Perform the indicated operation and simplify.

58) \(\frac{x}{x^2 - 16} - \frac{7}{x^2 + 5x + 4}\)

59) Perform the indicated operation. \(\frac{3}{2x^2} - \frac{7}{8x^2}\)

Graph the linear inequality.

60) \(3x + y \leq 2\)
61) $x + 3y \geq -2$

62) Find the quotient when $6m^2 + 17m - 28$ is divided by $m + 4$.

63) For $f(x) = 4x^2 + 3x + 2$, the parabola opens

   A) To the left  B) Upward
   C) To the right  D) Downward

Find the slope of the line.

64)
1) \(-3\)  
   Objective:  
2) \([-2 + \sqrt{7}, -2 - \sqrt{7}]\)  
   Objective: (9.2) Use Quadratic Formula to Solve Equation (Real Soln)  
3) \(D\)  
   Objective: (9.6) Match Equation with Graph  
4) \(\{2\sqrt{3}, -2\sqrt{3}\}\)  
   Objective: (9.1) Use Square Root Property to Solve Equation  
5) \([8, 26]\)  
   Objective: (9.1) Use Square Root Property to Solve Equation  
6) \(-9\)  
   Objective:  
7) \(-35a^2 + 26ab + 48b^2\)  
   Objective: (5.4) Multiply Two Binomials  
8) \(16x^2 + 56xy + 49y^2\)  
   Objective: (5.4) Square Binomial  
9) \(x^3 - 8\)  
   Objective: (0.4) Multiply Polynomials  
10) \(9a^2 - 25c^2\)  
    Objective: (5.4) Multiply Conjugate Binomials  
11) \((x + 5)(x^2 + 6)\)  
    Objective: (6.1) Factor by Grouping  
12) \((8r + 3y)(4r - x)\)  
    Objective: (6.1) Factor by Grouping  
13) \(x + 2\)  
    Objective: (6.4) Divide by Binomial  
14) \(12\)  
    Objective:  
15) \(\frac{36}{x}\)  
    Objective: (6.3) Simplify Complex Fraction  
16) \((-\infty, 5)\) or \((5, \infty)\)  
    Objective: (2.3) Find the Domain of a Function  
17) \((-\infty, 20]\)  
    Objective: (2.3) Find the Domain of a Function  
18) \((x + 9)(x - 10)\)  
    Objective: (5.6) Factor Trinomial with Lead Coefficient +/- 1  
19) \((2z + 3)(3z - 2)\)  
    Objective: (5.6) Factor Trinomial with Lead Coefficient > 1  
20) \((u - 8)\)  
    Objective: (5.6) Factor Trinomial with Lead Coefficient +/- 1  
21) \((5x + 2)(6x + 5)\)  
    Objective: (5.5) Factor by Grouping  
22) \(3x(x - 2)(x + 5)\)  
    Objective: (5.6) Factor Trinomial with Common Factor  
23) \((x - 7)(x^2 + 7x + 49)\)  
    Objective: (5.7) Factor Sum or Difference of Cubes  
24) \(-8\)  
    Objective: (5.8) a: Solve Apps: Numbers  
25) \(5\) feet by \(8\) feet  
    Objective: (1.5) Solve Problems Modeled by Quadratic Equations  
26) Quadrant IV  
    Objective: (3.1) Name the Quadrant in Which Point is Located  
27) \(\frac{1}{3}\)  
    Objective: (3.2) Calculate Slope  
28) Slope \(\frac{1}{2}\); y-intercept \((0, 1)\)  
    Objective: (3.3) Find Slope and y-Intercept from Standard Form  
29)  
    Objective: (3.2) Graph Line Given Point and Slope  
30) \(x = \frac{3 \pm i \sqrt{279}}{16}\)  
    Objective: (8.2) Solve By Quadratic Formula (Complex)  
31) \(\left\{-\frac{1}{8}, 7\right\}\)  
    Objective: (5.9) Solve; Zero Factor Property  
32) \(\frac{y + 5}{y + 6}\)  
    Objective: (6.1) Reduce Rational Expression  
33) \(37\)  
    Objective: (10.3) c: Remove Parentheses, Collect Terms, and Solve
Answer Key
Testname: 0312FINALREVIEW

34) \( r = \frac{-9k - 6y}{a - 1} \) or \( r = \frac{9k + 6y}{1 - a} \)
   Objective: (2.2) Solve Equation for Specified Variable

35) \( n = \frac{-1R}{Ir - E} \)
   Objective: (2.2) Solve Formula for Specified Variable

36) \( \frac{x + 2}{x^2 - 2x + 4} \)
   Objective: (6.1) Multiplication and Division of Rational Expressions

37) \( \frac{9p}{2} \)
   Objective: (6.3) Simplify Complex Fraction

38) \( \frac{36}{s} \)
   Objective: (6.3) Simplify Complex Fraction

39) \( \frac{2 - 4r}{4r} \)
   Objective: (6.3) Simplify Complex Fraction (Complicated)

40) No solution
   Objective: (4.1) Solve Linear System by Elimination Method

41) \( \left[ -\frac{3}{2}, \frac{1}{6} \right] \)
   Objective: (1.6) Solve Equations Involving Absolute Value

42) -9
   Objective: (7.1) Use f(x) Notation

43) 104
   Objective: (7.1) Use f(x) Notation

44) \( \left\{ \frac{1}{4} \right\} \)
   Objective: Solve Linear Equations

45) \( \left\{ 60 \right\} \)
   Objective: (2.1) Solve Linear Equation Having Fractions

46) \( \left\{ -2 \right\} \)
   Objective: (6.6) Solve Rational Equation

47) 27
   Objective: (12.1) f: Change Negative Exponent to Positive

48) 6x13
   Objective: (5.1) Simplify Using Product Rule

49) \( \frac{512}{729} \)
   Objective: (0.3) Understand and Use Rational Exponents

50) \( \frac{6}{61} + \frac{56}{61} \)
   Objective: (7.6) Divide Complex Numbers

51) \( \frac{28}{61} + \frac{3}{61}i \)
   Objective: (7.6) Divide Complex Numbers

52) \((6, \infty)\)
   Objective: (2.5) Solve Inequal: Graph & Give Interval Notation

53) \((\infty, 6]\)
   Objective: (2.5) Solve Inequal: Graph & Give Interval Notation

54) \(-61\sqrt{2}\)
   Objective: (7.3) Simplify Sum/Diff of Radicals (Index = 2)

55) \(49\sqrt{6}\)
   Objective: (7.3) Simplify Sum/Diff of Radicals (Index = 2)

56) \(6\sqrt{2}\)
   Objective: (7.3) Simplify Sum/Diff of Radicals (Index = 2)

57) \((2, 0), (0, -1)\)
   Objective: (3.1) Find Intercepts and Graph

58) \(\frac{x^2 - 6x + 28}{(x - 4)(x + 4)(x + 1)}\)
   Objective: (6.2) Add or Subtract Rational Expressions

59) \(\frac{5}{8x^2}\)
   Objective:
60) \[
\begin{array}{c}
\text{Objective: (3.4) Graph Linear Inequality}
\end{array}
\]

61) \[
\begin{array}{c}
\text{Objective: (3.4) Graph Linear Inequality}
\end{array}
\]

62) \[
\frac{6m}{7}
\]
Objective: (6.4) Divide by Binomial

63) B
Objective: (8.5) Determine How Parabola Opens

64) 2
Objective: (3.2) Find Slope Given Graph of Line