



Final Review Math 0314 - Intermediate Algebra

INSTRUCTIONS: This set of problems is meant to help you practice the kind of material that may appear on your final exam and does not represent exactly what your final will look like. There may be questions on your final that are unlike questions on this review and vice versa. No question on the review will be duplicated exactly on the final. Your final will consist of 33 multiple choice questions, so you should bring a scantron with you on the day of your final exam.

FINAL EXAM CALCULATOR POLICY: You are allowed to use a basic calculator during the final exam. You are NOT allowed to use a scientific or graphing calculator. Any calculator that is used must be a nonprogrammable calculator that is not capable of accessing the internet or interfacing with any other device, has a single line display, and has math operation keys that do not exceed addition, subtraction, multiplication, division, square root, percent, and negation (plus/minus). Using a smartphone as a calculator is strictly forbidden.

1) Solve the equation:

$$-4x + 4(2x - 4) = -5 - 7x$$

2) Solve the equation.

$$2k^2 = -27k - 81$$

3) Subtract.

$$(-6x^3 + 9x^2 + 4) - (-5x^3 + 2x - 5)$$

4) Add.

$$(4n^5 + 6n + 5n^2) + (-9n^2 + 3n^5 + 3n)$$

5) Solve the absolute value equation.

$$|14k - 7| = 9$$

6) Solve the rational equation.

$$\frac{t^2}{3} - \frac{t}{6} = 1$$

7) Divide the polynomials.

$$\frac{-30x^6y^4 + 30x^5y^4 - 3x^3y^7}{-15x^5y^4}$$

8) Multiply.

$$(9 + 4i)(3 - 8i)$$

9) Solve the inequality. Write your answer in interval notation.

$$3x < 17 \quad \text{and} \quad -19 + 2x \geq -24$$

- 10) Solve the inequality and graph the solution set. Write your answer in interval notation.

$$4(n - 3) > 2n \text{ or } 5 - 3n \geq 8$$

- 11) Simplify the expression so that no negative exponents appear in the final result. Assume all variables represent nonzero numbers.

$$(k^{-6})^7 k^6$$

- 12) Factor by grouping.

$$t^2 + 9t + 5t + 45$$

- 13) Factor.

$$x^3 + 7x^2 - 10x - 70$$

- 14) Decide whether the equation is conditional, an identity, or a contradiction. Give the solution set.

$$5(2x - 31) = 10x - 155$$

- 15) Multiply the polynomials.

$$(6x - 5)(3x^2 + x - 5)$$

- 16) Use the quadratic formula to solve the equation.

$$8x^2 + 7x = -2$$

- 17) Solve the inequality. Write the answer in interval notation.

$$-18 \leq 2x - 5 < 10$$

- 18) Simplify the expression involving rational exponents.

$$27^{4/3}$$

- 19) Factor the trinomial completely.

$$2h^2 + 16h + 24$$

- 20) Solve the rational equation.

$$\frac{5}{x} + \frac{5}{2} = \frac{3}{4}$$

- 21) Factor the binomial.

$$50q^2 - 72r^2$$

- 22) Use the quadratic formula to solve the equation.

$$4n^2 = -6n - 1$$

- 23) Use the slope formula to determine the slope of the line containing the two points.

$$(-6, -2) \text{ and } (-1, 4)$$

- 24) Find the domain. Write the answer in interval notation.

$$f(x) = \frac{14 + x}{x - 6}$$

- 25) Divide. Write the answer in the form $a + bi$.

$$\frac{6 + 2i}{9 - 3i}$$

- 26) Divide the polynomials by using long division.

$$(x^3 - 6x^2 - 30x - 7) \div (x + 3)$$

- 27) Divide the polynomials by using long division.

$$(12x^2 + 22x - 14) \div (3x + 7)$$

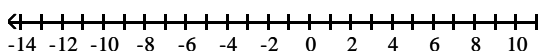
- 28) Find the product.

$$(3k - 11)(k + 9)$$

- 29) Write an equation of the line satisfying the given conditions.
The line passes through the point $(-4, -12)$ and has a slope of $\frac{5}{2}$.

Write the answer in slope-intercept form.

- 30) Solve the inequality and graph the solution set.
 $|6x - 5| \geq 4$

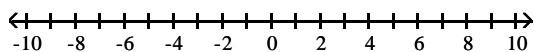


- 31) Find the root if it is a real number.
 $\sqrt[3]{-8}$

- 32) Solve the problem. Find $f(-3)$ when
 $f(x) = 4x^2 - 4x + 6$.

- 33) In a chemistry class, 9 liters of a 4% silver iodide solution must be mixed with a 10% solution to get a 6% solution. How many liters of the 10% solution are needed?

- 34) Solve the inequality and graph the solution set.
 $|4x + 2| < 5$



- 35) Solve the system by using the substitution method.

$$y = 3x + 5$$

$$2x - 5y = -12$$

- 36) Solve the system by Using the Addition Method.

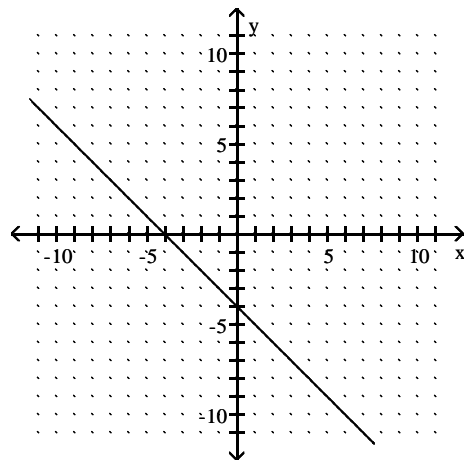
$$-5x - 7y = -15$$

$$-2x + 4y = -6$$

- 37) Write an equation of the line satisfying the given conditions.
The line passes through $(2, 4)$ and $(3, 7)$.

Find the slope of the line.

38)



- 39) Solve the absolute value equation.
 $|-5x + 4| - 12 = -4$

- 40) Solve the radical equation.
 $8t = \sqrt{64t^2 + 4t} - 19$

- 41) Write the coordinates of the vertex and determine if the vertex is a maximum point or a minimum point.

$$f(x) = (x + 3)^2 - 7$$

- 42) Simplify the expression and write the answer in lowest terms.

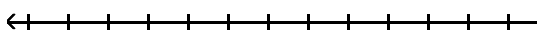
$$\frac{4x + 2}{12x^2 + 14x + 4}$$

- 43) Multiply and express in lowest terms.

$$\frac{4t - 4}{t} \cdot \frac{8t^2}{6t - 6}$$

- 44) Solve the inequality. Give the solution set in both interval and graph forms.

$$-3(6y - 7) < -21y + 12$$



- 45) Add or subtract as indicated and simplify if possible.

$$\frac{t^2 - 8}{t - 3} - \frac{-4t + 13}{t - 3}$$

- 46) Solve the equation.

$$-1 + \sqrt{3x + 5} = 3$$

- 47) Factor the sum or difference of cubes.

$$27u^3 + 125$$

- 48) Solve the equation by using the square root property.

$$(4x + 8)^2 = 81$$

- 49) Cody owns a hot dog stand. His profit, in dollars, is given by the function $P(x) = -x^2 + 14x + 59$, where x is the number of hot dogs sold. What is the most he can earn?

- 50) Express the rational expression in lowest terms.

$$\frac{x^2 - 5x - 14}{x^2 - 4x - 21}$$

- 51) Solve the equation:

$$-\frac{1}{5}(t + 6) - 2 = 3t + \frac{2}{3}$$

- 52) Multiply the polynomials.

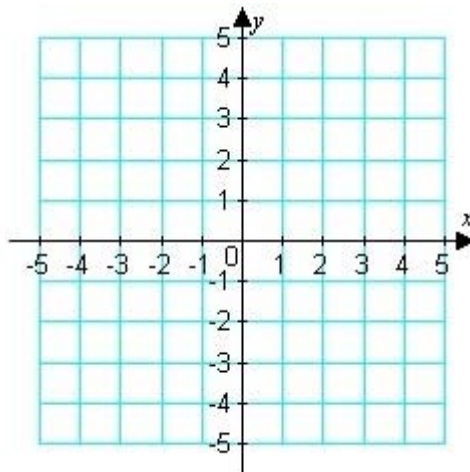
$$(-9t^8u^8)(-7t^6u^3)$$

- 53) Divide the rational expressions.

$$\frac{3x^2 + 3x}{2} \div \frac{x^2 - 1}{6x}$$

- 54) Write the equation in slope-intercept form. Then, graph the line using the slope and y -intercept.

$$2x - 3y = 6$$



- 55) Simplify the complex fraction.

$$\frac{4 + \frac{2}{x}}{\frac{x}{3} + \frac{1}{6}}$$

- 56) If 8 is decreased by the reciprocal of a number, the result is $\frac{7}{2}$. Find the number.

- 57) Divide the complex numbers. Write the answer in the form $a + bi$.

$$\frac{-8 + 3i}{5 + 7i}$$

- 58) Graph the function.

$$f(x) = (x - 4)^2$$

Answer Key

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1) $\{1\}$

2) $\left\{-\frac{9}{2}, -9\right\}$

3) $-x^3 + 9x^2 - 2x + 9$

4) $7n^5 - 4n^2 + 9n$

5) $\left\{\frac{8}{7}, -\frac{1}{7}\right\}$

6) $\left\{-\frac{3}{2}, 2\right\}$

7) $2x - 2 + \frac{y^3}{5x^2}$

8) $59 - 60i$

9) $\left[-\frac{5}{2}, \frac{17}{3}\right]$

10) $(-\infty, -1) \cup (6, \infty)$



11) $\frac{1}{k^{36}}$

12) $(t + 9)(t + 5)$

13) $(x + 7)(x^2 - 10)$

14) Identity; {all real numbers}

15) $18m^3 - 9m^2 - 35m + 25$

16) $\left\{\frac{-7 + i\sqrt{15}}{16}, \frac{-7 - i\sqrt{15}}{16}\right\}$

17) $\left[-\frac{13}{2}, \frac{15}{2}\right]$

18) 81

19) $2(m + 2)(m + 6)$

20) $\left\{-\frac{20}{7}\right\}$

21) $2(5q + 6r)(5q - 6r)$

22) $\left\{\frac{-3 + \sqrt{5}}{4}, \frac{-3 - \sqrt{5}}{4}\right\}$

23) $\frac{6}{5}$

24) $(-\infty, 6) \cup (6, \infty)$

25) $\frac{8}{15} + \frac{2}{5}i$

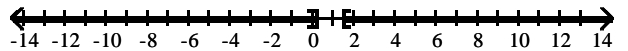
26) $x^2 - 9x - 3 + \frac{2}{x + 3}$

27) $4x - 2$

28) $3x^2 + 16x - 99$

29) $y = \frac{5}{2}x - 2$

30) $\left[-\infty, \frac{1}{6}\right] \cup \left[\frac{3}{2}, \infty\right)$

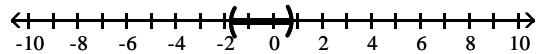


31) -2

32) 54

33) 4.5 liters

34) $\left[-\frac{7}{4}, \frac{3}{4}\right]$



35) $(-1, 2)$

36) $\{(3, 0)\}$

37) $y = 3x - 2$

38) -1

39) $\left\{-\frac{4}{5}, \frac{12}{5}\right\}$

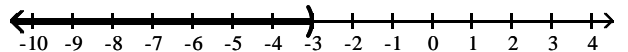
40) $\left\{\frac{19}{4}\right\}$

41) $(-3, -7)$; minimum

42) $\frac{1}{3x + 2}$

43) $\frac{16p}{3}$

44) $(-\infty, -3)$



45) $t + 7$

46) $\left\{\frac{11}{3}\right\}$

Answer Key

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47) $(3u + 5)(9u^2 - 15u + 25)$

48) $\left\{ \frac{1}{4}, -\frac{17}{4} \right\}$

49) \$108

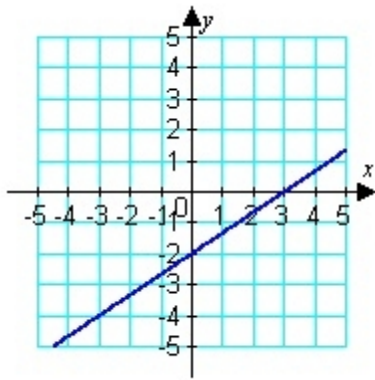
50) $\frac{y + 2}{y + 3}$

51) $t = -\frac{29}{24}$

52) $63t^{14}u^{11}$

53) $\frac{9x^2}{x - 1}$

54) $y = \frac{2}{3}x - 2$



55) $\frac{12}{x}$

56) $\frac{2}{9}$

57) $-\frac{19}{74} + \frac{71}{74}i$

58)

