Math Review Sheets Math 95 – Intermediate Algebra



The purpose of this Review Sheet is to provide students a comprehensive review of items that are taught in Math 95 classes. It is the KCC Math Department's objective to ensure students who enter a math class have the ability to perform satisfactorily in areas of study that are taught in the preceding class in the math sequence. The placement exam is only a small sampling of your knowledge. This set of problems offers a more comprehensive review to ensure the student possesses the skills expected of a student entering Math 111.

If you have been placed into Math 95 and feel you should have been placed higher, it is highly suggested you complete this review sheet before returning to retake the COMPASS exam.

Placement into a higher math class does not always ensure you have mastered the concepts expected of the prerequisite class. If you have placed into Math 111, it is suggested you review these sheets before the beginning of the term. Some topics covered in this review sheet will be taught as review in Math 111, but will be taught from the perspective that you have a familiarity with the topic.

How these sheets are helpful:

- To help students who have been out of school for some period of time and need to refresh their skills before returning
- To help students review before a placement exam
- To help you decide which math class is best for you. Your success and enjoyment of Math is usually based on getting started at the right level. Use this problem set along with the COMPASS exam to determine if your skill level is appropriate to move on to Math 111.
- To help students refresh their math skills during breaks between terms.

How to do the review:

- Pace yourself and don't rush. This is a comprehensive review of topics discussed from the adopted textbook for Math 95. It covers a variety of topics and it is not expected to be completed in one sitting.
- If you are having difficulty with a topic, consult the Learning Resources Center (LRC) for a copy of a textbook to borrow to help you relearn the concepts, or you may want to study with one of the onsite tutors. The whole point of these problems is to help you become more proficient in your math abilities. There are also many good web sites available to help you freshen up your knowledge of the concepts.
- Don't use these sheets as a substitution for taking a class. This review is designed to help you determine if you have the skills to proceed beyond Math 95.

This collection of Math 95 review problems have been taken from the adopted textbook of Klamath Community College. Further review of these materials can be found in the text.

Source: Blitzer, Robert. <u>Intermediate Algebra for College Students 3rd Edition</u>. New Jersey: Pearson Education, Inc., 2002. A copy of this book is on reserve at the Learning Resources Center at KCC along with other learning aides.

1. Solve each formula for the specified variable

$$I = prt$$
 for t $A = \frac{1}{2}h(a+b)$ for b

$$L = a + (n-1)d$$
 for d

2. Applications

The bus fare in a city is \$1.25. People who use the bus have the option of purchasing a monthly coupon book for \$21.00. With the coupon book, the fare is reduced to \$0.50. Determine the number o times in a month the bus must be used so that the total monthly cost without the coupon book is the same as the total monthly cost with the coupon book.

Including 8% sales tax, an inn charges \$162 per night. Find the inn's nightly cost before the tax is added.

3. Determine whether each relation is a function. Give the domain and the range for each relation.

 $\{(3,10), (4, 10), (5, 10)\} \{(13, 14), (15, 16), (13, 17)\}$

- 4. Find the indicated function value given f(x) = 7x 5f(0) f(3) f(-10)
 - f(2a) f(a+2)

5. Use the vertical line test to identify if each graph is a function or not.



6. Find the domain of the given function. State the domain in both set builder and interval notation

$$f(x) = 7x - 3$$
 $f(x) = x + \frac{3x}{x - 5}$

Set builder:

Interval:

7. Given $f(x) = x^2 - 2x$ g(x) = x - 5

Find each of the following (f+g)(x)

(f+g)(-2)

$$f(3) + g(3)$$
 $(f - g)(x)$

$$f(4) - g(4)$$
 (fg)(3)

$$\left(\frac{f}{g}\right)$$
(4) What is the domain of $\left(\frac{f}{g}\right)$ (x)

8. Determine the coefficient of each term, the degree of each term, the degree of the polynomial, the leading term, and the leading coefficient of the polynomial.

$-5x^3 + 7x^2 - x + 2$		
Term	Coefficient	Degree

9. Perform the indicated operation (add, subtract or multiply): $(-8x^3 + 5x^2 - 7x + 4) + (9x^3 - 11x^2 + 6x - 13)$

$$(7x^{3}-6x^{2}+5x-11)-(-8x^{3}+4x^{2}-6x-3)$$

$$(4x^2yz^5)(-3x^4yz^2)$$
 $7xy^2(3x^4y^2-5xy-1)$

$$(2x+5)(3x^2+7x-4)$$
 $(4x-1)(3x-5)$

 $\left(3x+7\,y\right)^2$

10. Factor

$$21x^2y^2 - 14xy^2 + 7xy x^3 - x^2 - 2x + 2$$

$$x^2 + 16xy + -17y^2 \qquad \qquad 3x^3 - 36x^2 + 33x$$

$$x^6 + x^3 - 30 \qquad \qquad 4x^2 - 25$$

$$9x^2 - 6x + 1 \qquad z^2 - 25x^2 + 10x - 1$$

$$125x^3 - 8$$
 $5x^2 - 45$

$$2y^3 + 12y^2 + 18y$$
 $8x^3 - 27$

11. Solve for x $x^2 + 6x = -5$ $3x^2 = 12x$ 12. Find the domain of the given rational function. State the domain in both set builder and interval notaion.

$$f(x) = \frac{x-6}{(x-3)(x+4)}$$

Set Builder:

Interval:

13. Simplify:

$$\frac{x^2 + 6x + 7}{x^2 - 49}$$

14. Multiply
$$\frac{x^2 - 9x + 14}{x^3 + 2x} x^2 - 4$$

15. Divide

$$\frac{x^2 + 16x + 64}{2x^2 - 128} x^2 + 10x + 16$$

$$x^2 - 6x - 16$$

16. Add then simplify

$$\frac{2}{x^2 - 5x + 6} + \frac{3}{x^2 - x - 6}$$

17. Subtract then simplify

$$\frac{y}{y^2 + 5y + 6} - \frac{2}{y^2 + 3y + 2}$$

18. Simplify

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

19. Use long division to divide

$$(10x^3 - 26x^2 + 17x - 13) \div (5x - 3)$$

20. Use synthetic division to divide

$$(3x^4 - 2x^2 - 10x - 20) \div (x - 2)$$

$$\frac{x+5}{x+1} - \frac{x}{x+2} = \frac{4x+1}{x^2+3x+2}$$

22. Solve for R
$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$$

23. Application

Working alone, two people can clean their house in 3 hours and 6 hours respectively. They have agreed to clean together so that they can finish in time to watch a TV program that begins in 1 ½ hours. How long will it take them to clean the house together? Can they finish before the program starts?

24. Find the indicated root, or state that the expression is not a real number

$$\sqrt{81}$$
 $-\sqrt{\frac{1}{100}}$ $\sqrt[3]{-27}$

25. Find the indicated function values for the function $f(x) = \sqrt{2x-5}$. If the function value is not a real number and does not exist, so state.

$$f(15)$$
 $f\left(\frac{5}{2}\right)$ $f(1)$

26. Find the domain of the given function. State in set builder and interval notation.

 $g(x) = \sqrt{100 - 4x}$ Set Builder:

Interval:

27. Simplify each expression. Assume that each variable can represent any real number, so include absolute value bars where necessary.

$$\sqrt{25x^2}$$
 $\sqrt{(x+14)^2}$ $\sqrt[3]{64x^3}$

28. Use radical notation to rewrite each expression. Simplify if possible.

$$16^{\frac{3}{2}}$$

29. Rewrite each expression with rational exponents

$$\left(\sqrt[3]{19xy}\right)^5$$

30. Use properties of rational exponents to simplify each expression $x^{\frac{1}{3}} \Box x^{\frac{1}{4}} \qquad (8x^{6}y^{3})^{\frac{1}{3}}$ 31. Use rational exponents to simplify each expression. If rational exponents appear after simplifying, write the answer in radical notation.

$$\sqrt[3]{x^9 y^{12}}$$
 $\frac{\sqrt[3]{x^2}}{\sqrt[4]{x^2}}$

32. Use the product rule to multiply $\sqrt{3x}$ $\sqrt{7y}$

33. Simplify by factoring. Assume that all variables in radicand represent positive real numbers _

$$\sqrt[3]{54x^8y^6}$$

34. Multiply and simplify. Assume that all variables in radicand represent positive real numbers

$$\sqrt[5]{2x^4y^3} [\sqrt[5]{8xy^6}]$$

35. Add or subtract as indicated. Assume that all variables in radicand represent positive real numbers .6

$$5\sqrt{18} - 3\sqrt{8}$$
 $\sqrt[3]{27x^4} + \sqrt[3]{xy}$

36. Simplify by using the quotient rule.

$$\sqrt{\frac{x^3}{100y^4}}$$

37. Divide and simplify

$$\frac{\sqrt[4]{64x^7}}{\sqrt[4]{2x^2}}$$

38. Multiply. If possible, simplify any radical expressions that appear in the product.

$$\left(\sqrt{7} - 3\sqrt{5}\right)\left(\sqrt{7} + 6\sqrt{5}\right) \qquad \left(\sqrt{5} + \sqrt{8}\right)^2$$

39. Rationalize the denominator and simplify

$$\sqrt{\frac{2x}{5y}} \qquad \qquad \frac{14}{\sqrt[3]{2x^2}}$$

$$\frac{\sqrt{x+5}}{\sqrt{x-3}}$$

40. Solve the radical equation

$$\sqrt{2x-3} + x = 3$$

41. Perform the indicated operation. Write the result in the form a + bi

(8-3i) - (17-7i) (7-5i)(2+3i) $\frac{6}{5+i}$

- 42. Simplify each expression i^{16} i^{23}
- 43. Solve by the square room property. $2x^2 - 3 = 125$

44. Complete the square for the given binomial. Then factor the resulting perfect square trinomial.

$$x^{2} + 20x$$

45. Solve by completing the square

$$2x^2 + 3x - 4 = 0$$

46. Solve by using the quadratic formula

$$x^2 = 2x + 4$$

47. Compute the discriminant. Then determine the number and type of solutions for the given equation

$$x^2 - 4x + 13 = 0 \qquad \qquad 2x^2 + 4x = 3$$

48. Solve each equation by the method of your choice.

$$(3x+5)(x-3)=5$$

$$3x^2 - x + 2 = 0$$



49. Use the vertex and intercepts to sketch the graph of each quadratic function. Give the equation for the parabola's axis of symmetry.

50. Application

A model rocket is launched upward from a platform 30 feet above the ground. The quadratic function $s(t) = -16t^2 + 400t + 40$ models the rocket's height above the ground, s(t), in feet, t seconds after it was launched. After how many seconds does the rocket reach its maximum height? What is the maximum height?