

Name _____

Math Teacher _____

**MAC 1105 College Algebra
Summer Packet
Port Charlotte High School**

Many topics that we will study next year in your dual credit class build on topics that you have already learned in previous classes. Since many of you may have been away from these ideas for a period of time, you might need a refresher in order to be up to speed at the beginning of the course. We have chosen a selection of topics for you to cover during the summer. Please understand that they are not all the areas that we will expect you to know.

Do all work for these problems on a separate sheet of paper in PENCIL. Anything written on the packet will not be graded. Work for each problem must be in chronological order. Just an answer is not sufficient for most problems and will count as a wrong answer. If you are unfamiliar with a term or type of problem, refer back to your notes or go online to the various help sites for mathematics (see below). The skills covered are part of the foundation for your course. Mastery of these skills is assumed.

Have this work ready for the first day of class. This packet will be collected. You will be graded on the number of problems you completed. At the end of the first week, you will be tested on this review material.

NO CALCULATORS OF ANY KIND MAY BE USED FOR MOST PROBLEMS IN THIS PACKET.

We look forward to working with you next year!

Free Online math help sites:

www.math.com/homeworkhelp/Algebra.html

<http://www.algebra-help.info/>

<http://www.algebrahelp.com/>

Name _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Evaluate the algebraic expression for the given value or values of the variable(s).

1) $1 + 5(x - 4)^3$; $x = 6$ 1) _____

2) $\frac{y - 3x}{8x + xy}$; $x = -4$ and $y = 3$ 2) _____

Solve.

3) A stone is dropped from a tower that is 710 feet high. The formula $h = 710 - 16t^2$ describes the stone's height above the ground, h , in feet, t seconds after it was dropped. What is the stone's height 3 seconds after it is released? 3) _____

Find the intersection of the two sets.

4) $\{1, 10, 8\} \cap \{5, 11\}$ 4) _____

Find the union of the two sets.

5) $\{2, 11\} \cup \{2, 5, 9\}$ 5) _____

List all numbers from the given set B that are members of the given Real Number subset.

6) $B = \{16, \sqrt{8}, -2, 0, 0.\bar{9}, \sqrt{9}\}$ Whole numbers 6) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

7) $B = \{20, \sqrt{8}, -22, 0, \frac{6}{7}, \sqrt{4}, 0.\bar{6}, 0.34\}$ Irrational numbers 7) _____

- A) $\sqrt{8}, \sqrt{4}, 0.34$ B) $\sqrt{8}, 0.\bar{6}$ C) $\sqrt{8}$ D) $\sqrt{8}, \sqrt{4}, 0.\bar{6}$

Determine whether the statement is true or false.

8) $-78 < 0$ 8) _____
 A) True B) False

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

9) $\pi < 3$ 9) _____

Rewrite the expression without absolute value bars.

10) $||-3| - |-5||$ 10) _____

Evaluate the expression for the given values of x and y .

11) $\frac{|x|}{x} + \frac{|y|}{y}$; $x = 2$ and $y = -4$ 11) _____

Express the distance between the given numbers using absolute value. Then find the distance by evaluating the absolute value expression.

12) 44.5 and 32.3

12) _____

State the name of the property illustrated.

13) $7 + (-3) = (-3) + 7$

13) _____

14) $11 \cdot (9 + 7) = 11 \cdot 9 + 11 \cdot 7$

14) _____

15) $(1 + 5) + 6 = (5 + 1) + 6$

15) _____

16) $\frac{1}{(x+7)}(x+7) = 1, x \neq -7$

16) _____

Simplify the algebraic expression.

17) $-5(2x - 9) - 4x + 5$

17) _____

Write the algebraic expression without parentheses.

18) $\frac{1}{4}(4x) + [(7x) + (-7x)]$

18) _____

Simplify the exponential expression.

19) $8^5 \cdot 8^8$

19) _____

20) $(8x^5)(7x^6)$

20) _____

21) $(-10x^5y)(-9x^3y^4)$

21) _____

22) $\frac{x^{11}y^8}{x^2y^3}$

22) _____

23) $\frac{-25x^{12}y^8}{5x^6y^2}$

23) _____

24) $-8y^0$

24) _____

25) $3^{-3} \cdot 3$

25) _____

26) $9x^{-8}y^8$

26) _____

27) $\frac{18x^7y^{10}}{6x^6y^{-8}}$

27) _____

28) $(x-4)^2$

28) _____

29) $(x^5y)^2$

29) _____

30) $(5x-8y^4z-8)^{-4}$

30) _____

31) $\left(\frac{-6x^4y^6}{3x^9y^{-2}}\right)^3$

31) _____

32) $\left(\frac{2x^3}{y^2}\right)^{-3}$

32) _____

Simplify the exponential expression. Assume that variables represent nonzero real numbers.

33) $\frac{(7x^4)^3}{x^{15}}$

33) _____

34) $\left(\frac{xy^3}{x^5y}\right)^{-2}$

34) _____

Evaluate the expression or indicate that the root is not a real number.

35) $-\sqrt{625}$

35) _____

36) $\sqrt{-144}$

36) _____

37) $\sqrt{144} + \sqrt{25}$

37) _____

38) $\sqrt{(-11)^2}$

38) _____

Use the product rule to simplify the expression.

39) $\sqrt{6x} \cdot \sqrt{30x}$

39) _____

Solve the problem.

- 40) The formula $v = \sqrt{2.5r}$ models the safe maximum speed, v , in miles per hour, at which a car can travel on a curved road with radius of curvature, r , in feet. A highway crew measures the radius of curvature at an exit ramp as 1000 feet. What is the maximum safe speed?

40) _____

Use the quotient rule to simplify the expression.

41) $\frac{\sqrt{72x^3}}{\sqrt{2x}}$

41) _____

Solve the problem.

- 42) The time, in seconds, that it takes an object to fall a distance d , in feet, is given by the algebraic expression $\sqrt{\frac{d}{16}}$. Find how long it will take a ball dropped from the top of a building 38 feet tall to hit the ground. Write the answer in simplified radical form.

42) _____

Add or subtract terms whenever possible.

43) $7\sqrt{2} + 8\sqrt{8}$

43) _____

44) $\sqrt{6x} + 6\sqrt{216x} + 6\sqrt{96x}$

44) _____

Rationalize the denominator.

45) $\frac{\sqrt{3}}{\sqrt{5}}$

45) _____

46) $\frac{\sqrt{3}}{\sqrt{11+3}}$

46) _____

47) $\frac{5}{\sqrt{5} + \sqrt{10}}$

47) _____

Evaluate the radical expressions or indicate that the root is not a real number.

48) $\sqrt[4]{10,000}$

48) _____

Simplify the radical expression.

49) $\sqrt[3]{14} \cdot \sqrt[3]{49}$

49) _____

Add or subtract terms whenever possible.

50) $9\sqrt[3]{448} + \sqrt[3]{56}$

50) _____

Evaluate the expression without using a calculator.

51) $16^{-3/2}$

51) _____

Simplify using properties of exponents.

52) $(8x^{2/3})(9x^{1/4})$

52) _____

Simplify by reducing the index of the radical.

53) $\sqrt[6]{x^4}$

53) _____

Is the algebraic expression a polynomial? If it is, write the polynomial in standard form.

54) $6x + 3 + 6x^2$

54) _____

55) $x^2 + x^4 - x^3 - 1$

55) _____

Find the degree of the polynomial.

56) $20x^3 + 3x^2 + 5x + 4x^4 - 3$

56) _____

Perform the indicated operations. Write the resulting polynomial in standard form.

57) $(5x^7 - 2x^6 + 4x^5 + 8) + (9x^7 + 8x^6 + 7x^5 + 2)$

57) _____

58) $(7x^5 + 12x^4 - 2) - (4x^5 - 2x^4 - 17)$

58) _____

Find the product.

59) $(x + 10)(x^2 + 4x - 9)$

59) _____

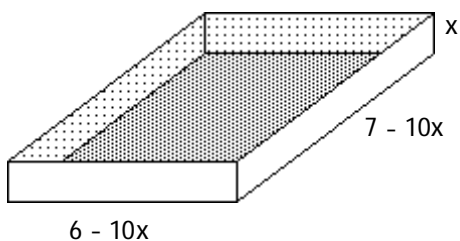
60) $(7x^2 - 10)(3x^2 + 1)$

60) _____

Solve the problem.

61) Write a polynomial in standard form that represents the volume of the open box.

61) _____



Find the product.

62) $(2x + 5)(2x - 5)$

62) _____

63) $(9x + 2)^2$

63) _____

64) $(5x - 3)^3$

64) _____

Perform the indicated operations.

65) $(9x^4y^2 - 10x^2y^2 + 8xy) + (4x^4y^2 - 2x^2y^2 + 5xy)$

65) _____

Find the product.

66) $(m - n)(m^2 + mn + n^2)$

66) _____

Factor out the greatest common factor.

67) $14x^4 - 6x^3 + 8x^2$

67) _____

68) $x^2(x - 9) - (x - 9)$

68) _____

Factor and simplify the algebraic expression.

69) $x^{7/8} - x^{1/8}$

69) _____

70) $7x^{-4/5} + 42x^{1/5}$

70) _____

71) $(x + 8)^{1/4} + (x + 8)^{3/4}$

71) _____

Factor by grouping. Assume any variable exponents represent whole numbers.

72) $x^3 + 8x - 4x^2 - 32$

72) _____

Factor the trinomial, or state that the trinomial is prime.

73) $x^2 - 8x - 9$

73) _____

74) $6x^2 + 13xy + 6y^2$

74) _____

Factor the difference of two squares.

75) $81x^2 - 64$

75) _____

Factor the perfect square trinomial.

76) $x^2 + 10x + 25$

76) _____

Factor using the formula for the sum or difference of two cubes.

77) $27x^3 + 8$

77) _____

Factor completely, or state that the polynomial is prime.

78) $12x^3 - 192x$

78) _____

79) $4b^2x - 49y - 49x + 4b^2y$

79) _____

Factor using the formula for the sum or difference of two cubes.

80) $125x^3 + 27$

80) _____

Factor completely, or state that the polynomial is prime.

81) $2x^4 - 32$

81) _____

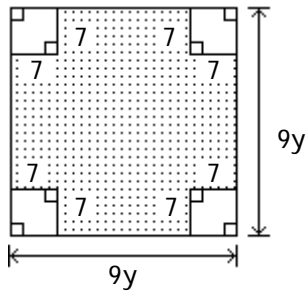
82) $x^2 + 64$

82) _____

Solve the problem.

83) Write an expression for the area of the shaded region and express it in factored form.

83) _____



Factor and simplify the algebraic expression.

84) $(x + 3)^{2/5} - (x + 3)^{12/5}$

84) _____

Find all numbers that must be excluded from the domain of the rational expression.

85) $\frac{4}{x + 5}$

85) _____

86) $\frac{x + 6}{x^2 - 14x + 48}$

86) _____

Simplify the rational expression. Find all numbers that must be excluded from the domain of the simplified rational expression.

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

87) _____

Multiply or divide as indicated.

88) $\frac{4x - 4}{x} \cdot \frac{2x^2}{9x - 9}$

88) _____

89) $\frac{x^2 + 12x + 35}{x^2 + 14x + 45} \cdot \frac{x^2 + 9x}{x^2 + 3x - 28}$

89) _____

90) $\frac{21x - 21}{9} \div \frac{7x - 7}{18}$

90) _____

91) $\frac{x^2 + 9x + 20}{x^2 + 11x + 30} \div \frac{x^2 + 4x}{x^2 + 10x + 24}$

91) _____

Add or subtract as indicated.

92) $\frac{x^2 - 10x}{x^2 + 4x} + \frac{x^2 + x}{x^2 + 4x}$

92) _____

$$93) \frac{1}{x-8} - \frac{11}{8-x}$$

93) _____

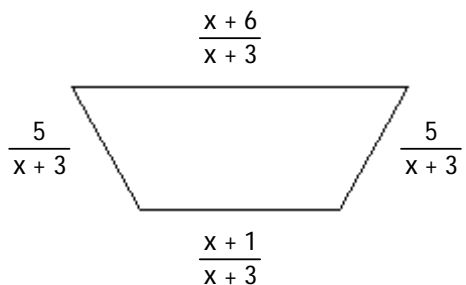
$$94) \frac{x+8}{x^2+8x+15} + \frac{5x+7}{x^2+3x-10}$$

94) _____

Solve the problem.

95) Express the perimeter of the trapezoid as a single rational expression.

95) _____



Simplify the complex rational expression.

$$96) \frac{1 - \frac{1}{x}}{4 + \frac{1}{x}}$$

96) _____

$$97) \frac{x - \frac{x}{x+4}}{x+3}$$

97) _____