



ST. BRENDAN
HIGH SCHOOL

Champagnat
College Algebra
Summer Math Packet

Congratulations and welcome to College Algebra!

This summer math packet is a review of some of the concepts learned in Algebra 2 that will be needed for College Algebra. It will assure that all students begin the school year on the same page and with equal opportunity to succeed in College Algebra.

Instructions for completing the packet:

- Please print the packet or use loose leaf paper to complete the packet by hand showing all work. Work must be neat and legible.
- Please use your Algebra 2 notes or the websites provided to help you if you need reminders on how to complete some practice problems.
- Take notes as you complete your work. You will be given a quiz on this material the first week of school.
- Work on the packet with your friends. Help each other. Every student is responsible for knowing the material in this packet when you return in August. We will review as a team and everyone will be expected to participate.
- Bring your packet to our first class together. It will be collected for a grade. Only packets done with paper and pencil will be accepted.

Helpful Websites:

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

<http://www.purplemath.com/modules/index.htm>

<https://www.khanacademy.org>

Helpful for graphing functions:

<https://www.education.ti.com/en/resources/family-of-functions>

Name _____

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

1) $(x + 3y)^2$; $x = 3$ and $y = 2$

1) _____

2) $5 + 6(x - 7)^3$; $x = 9$

2) _____

3) $x^2 - 5(x - y)$; $x = 8$ and $y = 2$

3) _____

4) $\frac{9(x - 1)}{2x + 4}$; $x = 7$

4) _____

5) $\frac{y - 2x}{4x + xy}$; $x = -4$ and $y = 5$

5) _____

Find the slope of the line that goes through the given points.

6) $(-5, -8), (-8, 6)$

6) _____

7) $(7, 0), (0, 2)$

7) _____

8) $(6, -3), (-3, 2)$

8) _____

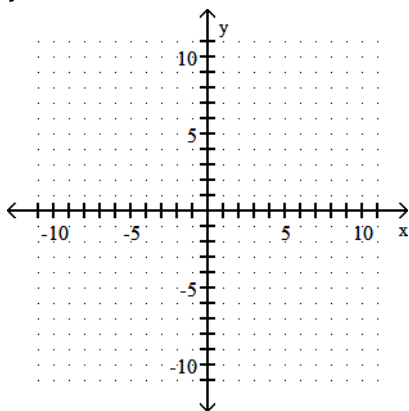
9) $(5, 1), (6, 6)$

9) _____

Graph the equation.

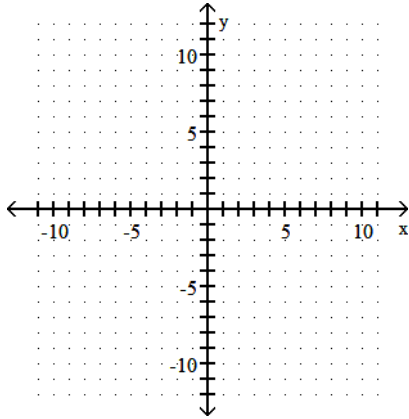
10) $y = 3x$

10) _____



11) $y = -\frac{2}{9}x - 9$

11) _____



Find the indicated value.

12) Find $f(-4)$ when $f(x) = 8x + 11$.

12) _____

13) Find $f(2)$ when $f(x) = 4x^2 + 4x + 4$.

13) _____

14) Find $f(0)$ when $f(x) = \frac{1}{7}x$.

14) _____

Solve.

15) The formula $C = \frac{5}{9}(F - 32)$ expresses the relationship between Fahrenheit temperature, F , and Celsius temperature, C . Use the formula to convert 41°F to its equivalent temperature on the Celsius scale.

15) _____

16) A stone is dropped from a tower that is 740 feet high. The formula $h = 740 - 16t^2$ describes the stone's height above the ground, h , in feet, t seconds after it was dropped. What is the stone's height 1 seconds after it is released?

16) _____

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

17) $B = \{18, \sqrt{6}, -15, 0, 0.\bar{6}, \sqrt{25}\}$ Integers

17) _____

18) $B = \{6, \sqrt{5}, -22, 0, 0.\bar{4}, \sqrt{25}\}$ Natural numbers

18) _____

19) $B = \{4, \sqrt{6}, -21, 0, 0.\bar{4}, \sqrt{9}\}$ Whole numbers

19) _____

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

20) $\frac{|x|}{x} + \frac{|y|}{y}$; $x = 4$ and $y = -1$

20) _____

State the name of the property illustrated.

21) $5 + (-3) = (-3) + 5$

21) _____

22) $14 \cdot (7 + 1) = 14 \cdot 7 + 14 \cdot 1$

22) _____

23) $2 + (21 + 22) = (2 + 21) + 22$

23) _____

Simplify the algebraic expression.

24) $-7(2r + 6) + 4(6r + 5)$

24) _____

25) $(8z + 10) - (3z - 8)$

25) _____

26) $-5(2x - 7) - 4x + 5$

26) _____

Write the algebraic expression without parentheses.

27) $\frac{1}{4}(4x) + [(3x) + (-3x)]$

27) _____

28) $-(7z - 8w + 8y)$

28) _____

Simplify the exponential expression.

29) $x^3 \cdot x^9$

29) _____

30) $(-6x^7)(-4x^9)$

30) _____

31) $(-10x^4y)(-4x^5y^2)$

31) _____

32) $\frac{x^6}{x^2}$

32) _____

33) $\frac{x^4}{x^7}$

33) _____

34) $\frac{5x^5}{x^3}$

34) _____

35) $\frac{27x^{13}}{3x^3}$

35) _____

36) $\frac{x^{13}y^{13}}{x^7y^4}$

36) _____

37) $\frac{72x^5y^{11}}{9x^2y^5}$

37) _____

38) $\frac{-14x^2}{2x^7}$

38) _____

39) $\frac{30x^{11}y^{10}z^6}{5x^3y^4z^5}$

39) _____

40) $(-8)^0$

40) _____

41) -7^0

41) _____

42) 2^{-3}

42) _____

43) $(-3)^{-2}$

43) _____

44) $x^6 \cdot x^{-2}$

44) _____

45) $\frac{x^{-9}}{x^2}$

45) _____

46) $\frac{63x^{20}y^5}{7x^{19}y^{-3}}$

46) _____

47) $(x^5)^9$

47) _____

48) $(11x^7)^2$

48) _____

49) $(-6x^3y^6)^2$

49) _____

50) $(5x^3)^{-2}$

50) _____

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

51) _____

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

52) $\frac{(2x^2)^3}{x^{15}}$

52) _____

53) $\left(\frac{xy^6}{x^6y}\right)^{-2}$

53) _____

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

54) $\sqrt{-121}$

54) _____

55) $-\sqrt{9}$

55) _____

56) $\sqrt{144 + 25}$

56) _____

57) $\sqrt{16} + \sqrt{9}$

57) _____

Use the product rule to simplify the expression.

58) $\sqrt{275}$

58) _____

59) $\sqrt{147}$

59) _____

Use the quotient rule to simplify the expression.

60) $\sqrt{\frac{1}{9}}$

60) _____

61) $\frac{\sqrt{100x^4}}{\sqrt{5x}}$

61) _____

Add or subtract terms whenever possible.

62) $4\sqrt{6} + 8\sqrt{6}$

62) _____

63) $9\sqrt{3} + 6\sqrt{75}$

63) _____

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

64) $\sqrt[4]{16}$

64) _____

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

65) $(7x^5 + 2x^2 - 8x) + (4x^5 + 3x^2 + 5x)$

65) _____

66) $(9x^7 + 2x^6 + 6x^5 + 4) + (9x^7 + 7x^6 - 8x^5 - 6)$

66) _____

67) $(5x^7 + 14x^4 + 17) - (2x^7 - 14x^4 + 20)$

67) _____

68) $(6x^4 + 8x^3 - 5x^2 + 5) - (2x^4 + 3x^3 - 7x^2 - 6)$

68) _____

Find the product.

69) $(x + 9)(x^2 + 4x - 7)$

69) _____

70) $(9x + 11)(5x + 4)$

70) _____

71) $(3x + 1)(x + 10)$

71) _____

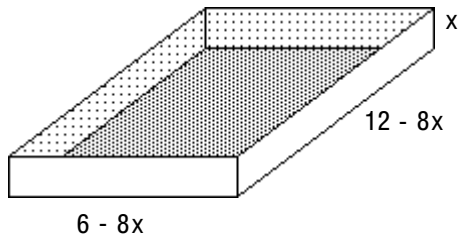
72) $(x + 11)(x + 7)$

72) _____

Solve the problem.

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

73) _____



Find the product.

74) $(3x + 8)(3x - 8)$

74) _____

75) $(4x^2 + 7x)(4x^2 - 7x)$

75) _____

76) $(x + 4y)(2x - 3y)$

76) _____

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

77) _____

Factor out the greatest common factor.

78) $5x - 20$

78) _____

79) $5x^2 + 30x$

79) _____

80) $14x^4 - 6x^3 + 10x^2$

80) _____

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

81) $x^3 - 4x^2 + 2x - 8$

81) _____

82) $x^3 + 7x - 5x^2 - 35$

82) _____

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

83) $x^2 - 12x + 27$

83) _____

84) $x^2 + 14x + 48$

84) _____

85) $x^2 - 16x + 63$

85) _____

86) $x^2 + 5x - 36$

86) _____

87) $x^2 - x - 6$

87) _____

88) $x^2 - x - 54$

88) _____

89) $2x^2 - 7x - 15$

89) _____

90) $7x^2 - 5x + 2$

90) _____

91) $x^2 - 15xy + 54y^2$

91) _____

Factor the difference of two squares.

92) $x^2 - 144$

92) _____

93) $4x^2 - 49$

93) _____

94) $81x^2 - 121y^2$

94) _____

Factor the perfect square trinomial.

95) $x^2 + 4x + 4$

95) _____

96) $x^2 - 15x + 225$

96) _____

97) $49x^2 + 14x + 1$

97) _____

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

98) $\frac{4}{x - 9}$

98) _____

99) $\frac{x + 5}{x^2 - 36}$

99) _____

100) $\frac{x + 3}{x^2 - 8x + 15}$

100) _____

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

101) $\frac{x^2 + 10x + 25}{x^2 + 14x + 45}$

101) _____

Multiply or divide as indicated.

$$102) \frac{6x}{12x+6} \cdot \frac{10x+5}{3}$$

102) _____

$$103) \frac{6x-6}{x} \cdot \frac{9x^2}{8x-8}$$

103) _____

$$104) \frac{x^2-5x+6}{x^2+x-6} \cdot \frac{x^2-4}{x^2-x-6}$$

104) _____

$$105) \frac{4x+12}{10} \div \frac{2x+6}{6}$$

105) _____