Name_____

ACP Pre-Calculus Summer Packet (to be handed in the first day of school)

*This Review is for students entering ACP Pre-Calculus
*This assignment covers Chapter P in the Text. The text is on line with the assignment.
*We begin with Chapter 1 in September.
*You will be tested on Chapter P during the first week of school.

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

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

1) $5x + 3$; $x = 3$ 1) _____
A) 30 B) 12 C) 8 D) 18

2) $10x^2 + 4y$; $x = 7$ and $y = 3$ 2) _____
A) 502 B) 1590 C) 118 D) 4912

Solve.

3) The formula $C = \frac{5}{9}(F - 32)$ expresses the relationship between Fahrenheit temperature, F, and Celsius temperature, C. Use the formula to convert 59°F to its equivalent temperature on the Celsius scale. 3) _____
A) 51°C B) 49°C C) 15°C D) 3°C

Find the intersection of the two sets.

4) $\{2, 7, 5, 9\} \cap \{5, 6, 2\}$ 4) _____
A) {2} B) {2, 5} C) ∅ D) {2, 5, 9, 7, 6}

Find the union of the two sets.

5) $\{1, 11\} \cup \{1, 4, 9\}$ 5) _____
A) {4, 9, 11} B) ∅ C) {1} D) {1, 4, 9, 11}

Determine whether the statement is true or false.

6) $7 > 20$ 6) _____
A) True B) False

7) $-14 \geq 18$ 7) _____
A) False B) True

Rewrite the expression without absolute value bars.

8) $|-6|$ 8) _____
A) 12 B) 0 C) 6 D) -6

9) $||-2| - |-4||$ 9) _____
A) 2 B) -2 C) 6 D) -6

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

10) 28 and 98 10) _____

A) $|28 - 98| = 70$
B) $-|28 + 98| = -126$
C) $-|98 - 28| = -70$
D) $|28 + 98| = 126$

Simplify the algebraic expression.

11) $-4(9r + 7) + 5(4r + 5)$ 11) _____

A) $-16r + 7$ B) $-16r - 3$ C) $r + 3$ D) $-64r$

Write the algebraic expression without parentheses.

12) $-(8x - 2)$ 12) _____

A) $-8x + 2$ B) $16x$ C) $8x - 2$ D) $-8x - 2$

Evaluate the exponential expression.

13) $2^3 \cdot 4$ 13) _____

A) 512 B) 24 C) 12 D) 32

14) 10^0 14) _____

A) -1 B) 1 C) 0 D) 10

15) $(-5)^3$ 15) _____

A) 125 B) 15 C) -125 D) -15

16) -5^{-4} 16) _____

A) $\frac{1}{20}$ B) -625 C) 625 D) $-\frac{1}{625}$

Simplify the exponential expression.

17) $x \cdot x^7$ 17) _____

A) $2x^8$ B) $2x^7$ C) x^7 D) x^8

18) x^6y^0 18) _____

A) x^6 B) 0 C) 1 D) $\frac{1}{x^6}$

19) $(x^{-3})^{-3}$ 19) _____

A) $\frac{1}{x^6}$ B) $\frac{1}{x^9}$ C) $-x^6$ D) x^9

20) $\frac{x^{-7}}{x^3}$ 20) _____

A) x^{10} B) $\frac{1}{x^{21}}$ C) $\frac{1}{x^{10}}$ D) $\frac{1}{x^4}$

21) $(2x)^3$ 21) _____

A) $8x^3$ B) $8x$ C) $6x$ D) $6x^3$

22) $(-4x^4y^{-5})(2x^{-1}y)$ 22) _____

A) $\frac{-8x^5}{y^6}$ B) $\frac{-8x^3}{y^4}$ C) $-8x^3y^6$ D) $\frac{-2x^3}{y^4}$

Write the number in decimal notation without the use of exponents.

23) 9×10^5 23) _____

A) 900,000 B) 9,000,000 C) 0.00009 D) 0.000009

24) 7.26×10^{-4} 24) _____

A) 0.00726 B) 0.000726 C) -726,000 D) 0.0000726

Write the number in scientific notation.

25) 43,012 25) _____

A) 4.3012×10^5 B) 4.3012×10^{-4} C) 4.3012×10^4 D) 4.3012×10^1

26) 0.000815 26) _____

A) 8.15×10^{-3} B) 8.15×10^{-5} C) 8.15×10^{-4} D) 8.15×10^4

Perform the indicated computation. Write the answer in scientific notation.

27) $(6 \times 10^8)(4.2 \times 10^4)$ 27) _____

A) 2.52×10^{32} B) 252×10^{12} C) 25.2×10^{13} D) 2.52×10^{13}

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

28) $\sqrt{81}$ 28) _____

A) $\frac{1}{81}$ B) 9

C) 6561 D) Not a real number

29) $\sqrt{16+9}$ 29) _____

A) 25 B) $\sqrt{7}$ C) 7 D) 5

30) $\sqrt{-196}$ 30) _____

A) 14 B) 38,416

C) $\frac{14}{196}$ D) Not a real number

31) $\sqrt{144}+\sqrt{25}$ 31) _____

A) 169 B) 17 C) 13 D) $\sqrt{119}$

32) $\sqrt{(8)^2}$ 32) _____

A) 4096 B) $\frac{1}{64}$

C) 8 D) Not a real number

Use the product rule to simplify the expression.

33) $\sqrt{63}$ 33) _____

A) 21 B) $7\sqrt{3}$ C) 7 D) $3\sqrt{7}$

34) $\sqrt{294x^2}$ 34) _____

A) $6x^2\sqrt{7}$ B) $7|x|\sqrt{6}$ C) $7\sqrt{6x}$ D) $294x$

Use the quotient rule to simplify the expression.

35) $\sqrt{\frac{1}{25}}$ 35) _____

A) 5 B) $\frac{1}{5}$ C) $\frac{1}{625}$ D) 25

36) $\sqrt{\frac{4}{81}}$ 36) _____

A) 0 B) $\frac{\sqrt{2}}{\sqrt{9}}$ C) $\frac{\sqrt{2}}{9}$ D) $\frac{2}{9}$

37) $\frac{\sqrt{80x^3}}{\sqrt{5x}}$ 37) _____

A) $4|x|\sqrt{5}$ B) $5x^2$ C) $4|x|$ D) $\frac{4x^2}{\sqrt{5}}$

Add or subtract terms whenever possible.

38) $6\sqrt{5} - 4\sqrt{5}$ 38) _____

A) $-24\sqrt{10}$ B) $10\sqrt{5}$ C) $\sqrt{5}$ D) $\sqrt{10}$

39) $7\sqrt{2} + 9\sqrt{8}$ 39) _____

A) $11\sqrt{2}$ B) $16\sqrt{2}$ C) $25\sqrt{2}$ D) $-25\sqrt{2}$

40) $\sqrt{25} + \sqrt{48} + \sqrt{49} + \sqrt{300}$ 40) _____

A) $\sqrt{48} + \sqrt{300} + 12$ B) $14\sqrt{3} + 12$

C) $116\sqrt{3} + 12$ D) $14\sqrt{3} + \sqrt{25} + \sqrt{49}$

Rationalize the denominator.

41) $\frac{\sqrt{100}}{\sqrt{7}}$ 41) _____

A) $\frac{100\sqrt{7}}{7}$ B) 59 C) $\frac{10\sqrt{7}}{7}$ D) $10\sqrt{7}$

42) $\frac{1}{\sqrt{11}}$ 42) _____

A) $1+\sqrt{11}$ B) $\frac{\sqrt{11}}{11}$ C) $\sqrt{11}$ D) $\frac{1+\sqrt{11}}{11}$

43) $\frac{4}{5-\sqrt{10}}$ 43) _____

A) $\frac{20-4\sqrt{10}}{15}$ B) $\frac{20+4\sqrt{10}}{15}$ C) $\frac{4}{5}-\frac{4}{\sqrt{10}}$ D) $\frac{20+4\sqrt{10}}{5}$

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

44) $\sqrt[3]{27}$ 44) _____

A) 27 B) 3
C) -3 D) not a real number

45) $\sqrt[4]{16}$ 45) _____

A) 16 B) 2
C) -2 D) not a real number

46) $\sqrt[3]{(-2)^3}$ 46) _____

A) -2 B) -8
C) 2 D) not a real number

Evaluate the expression without using a calculator.

47) $64^{1/2}$ 47) _____

A) 32 B) 8 C) 16 D) 4

48) $8^{4/3}$ 48) _____

A) 128 B) 32 C) 64 D) 16

Simplify by reducing the index of the radical.

49) $\sqrt[6]{x^4}$ 49) _____

A) $\sqrt{x}$ B) $\sqrt{x^2}$ C) $\sqrt[3]{x^2}$ D) $\sqrt[3]{x}$

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

50) $8x-3+6x^2$ 50) _____

A) Yes; $6x^2+8x-3$ B) No

Find the degree of the polynomial.

51) $-6x + 2x^8 + 5x^7 - 24$ 51) _____

A) degree 2 B) degree 7 C) degree 8 D) degree 4

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

52) $(7x^5 + 2x^4 + 2x) + (6x^5 - 5x^4 - 5x)$ 52) _____

A) $7x^{10}$ B) $13x^5 - 3x^4 - 3x$ C) $13x - 3x^5 - 3x^4$ D) $8x^5 + 2x^4 - 3x$

53) $(6x^6 + 4x^5 + 9) - (3x^6 - 10x^5 - 12)$ 53) _____

A) $3x^6 + 14x^5 + 21$ B) $3x^6 + 14x^5 - 3$ C) $3x^6 + 7x^5 - 3$ D) $38x^{11}$

Find the product.

54) $(x - 4)(x^2 + 4x + 16)$ 54) _____

A) $x^3 + 8x^2 + 8x - 64$ B) $x^3 - 64$

C) $x^3 - 8x^2 - 8x - 64$ D) $x^3 + 64$

55) $(5x - 1)(x^2 - 3x + 1)$ 55) _____

A) $5x^3 + 16x^2 - 8x + 1$ B) $5x^3 - 15x^2 + 5x + 1$

C) $5x^3 - 16x^2 + 8x - 1$ D) $5x^3 - 14x^2 + 2x - 1$

56) $(3x + 1)(x - 10)$ 56) _____

A) $3x^2 - 29x - 10$ B) $x^2 - 29x - 30$ C) $x^2 - 10x - 29$ D) $3x^2 - 30x - 10$

57) $(6x^2 + 5)(5x^2 - 1)$ 57) _____

A) $30x^4 + 19x^2 + 19$ B) $11x^4 + 19x^2 - 5$

C) $30x^4 + 19x^2 - 5$ D) $30x^2 + 19x - 5$

58) $(x + 6)(x - 6)$ 58) _____

A) $x^2 - 12$ B) $x^2 + 12x - 36$ C) $x^2 - 12x - 36$ D) $x^2 - 36$

59) $(1 + x^3)(1 - x^3)$ 59) _____

A) $2 - x^6$ B) $1 - x^9$ C) $1 - x^6$ D) $2 - x^9$

60) $(8x + 11)^2$ 60) _____

A) $64x^2 + 176x + 121$ B) $8x^2 + 121$

C) $64x^2 + 121$ D) $8x^2 + 176x + 121$

61) $(7x - 5)^2$ 61) _____

A) $7x^2 + 25$ B) $7x^2 - 70x + 25$ C) $49x^2 - 70x + 25$ D) $49x^2 + 25$

62) $(x - 3y)(x - 9y)$ 62) _____

A) $x^2 - 12xy - 12y^2$ B) $x^2 - 15xy + 27y^2$

C) $x - 12xy + 27y$ D) $x^2 - 12xy + 27y^2$

63) $(13x + 3y)(13x - 3y)$ 63) _____

A) $13x^2 - 3y^2$ B) $169x^2 + 78xy - 9y^2$

C) $169x^2 - 78xy - 9y^2$ D) $169x^2 - 9y^2$

Factor out the greatest common factor.

64) $2x^2 + 12x$ 64) _____

A) $2(x^2 + 6x)$ B) $2x(x + 6x)$ C) $x(2x + 12)$ D) $2x(x + 6)$

65) $x(x + 9) + 5(x + 9)$ 65) _____

A) $(x^2 + 9x) + (5x + 45)$ B) $(x + 9)(x + 5)$

C) $5x(x + 9)$ D) $9x(x + 5)$

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

66) $x^3 - 4x^2 - 5x + 20$ 66) _____

A) $(x + 4)(x^2 + 5)$ B) $(x - 4)(x - 5)$ C) $(x - 4)(x^2 - 5)$ D) $(x - 5)(x^2 - 4)$

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

67) $x^2 - 3x - 18$ 67) _____

A) $(x - 3)(x + 1)$ B) $(x + 3)(x - 6)$ C) $(x - 3)(x - 6)$ D) prime

68) $3x^2 - 7x + 20$ 68) _____

A) $(3x - 4)(x + 5)$ B) $(3x + 5)(x - 4)$ C) $(3x - 5)(x + 4)$ D) prime

69) $9x^2 - 6x - 8$ 69) _____

A) $(9x + 2)(x - 4)$ B) $(3x + 2)(3x - 4)$ C) $(3x - 2)(3x + 4)$ D) prime

Factor the difference of two squares.

70) $x^2 - 121$ 70) _____

A) $(x + 11)(x - 11)$ B) $(x - 11)^2$ C) $(x + 11)^2$ D) prime

71) $49x^2 - 9$ 71) _____

A) $(7x - 3)^2$ B) $(7x + 3)^2$ C) $(7x + 3)(7x - 3)$ D) prime

72) $x^4 - 256$ 72) _____

A) $(x^2 + 16)(x + 4)(x - 4)$ B) $(x^2 - 16)(x^2 - 16)$

C) $(x^2 + 16)(x^2 + 16)$ D) prime

Factor the perfect square trinomial.

73) $x^2 + 16x + 64$ 73) _____

A) $(x - 8)^2$ B) $(x + 8)^2$ C) $(x + 8)(x - 8)$ D) prime

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

74) $x^3 - 8$ 74) _____

A) $(x + 8)(x^2 - 1)$ B) $(x - 2)(x^2 + 2x + 4)$

C) $(x + 2)(x^2 - 2x + 4)$ D) prime

75) $x^3 + 27$ 75) _____

A) $(x + 3)(x^2 + 9)$ B) $(x - 3)(x^2 + 3x + 9)$

C) $(x + 3)(x^2 - 3x + 9)$ D) prime

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

76) $\frac{6}{x - 2}$ 76) _____

A) $x \neq -2$ B) $x \neq 0$ C) $x \neq -6$ D) $x \neq 2$

77) $\frac{x - 8}{x^2 - 64}$ 77) _____

A) $x \neq 8, x \neq -8$ B) $x \neq 64$ C) $x \neq \frac{1}{8}$ D) $x \neq 8$

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

78) $\frac{2x + 2}{6x^2 + 16x + 10}$ 78) _____

A) $\frac{2x + 2}{6x^2 + 16x + 10}, x \neq -\frac{5}{3}, x \neq -1$ B) $\frac{2x}{3x + 5}, x \neq -\frac{5}{3}$

C) $\frac{2x + 3}{3x + 16}, x \neq -\frac{16}{3}$ D) $\frac{1}{3x + 5}, x \neq -\frac{5}{3}, x \neq -1$

Multiply or divide as indicated.

79) $\frac{6x}{12x + 6} \cdot \frac{14x + 7}{6}$ 79) _____

A) $\frac{7}{6}$ B) $\frac{x}{6}$ C) $\frac{7x}{6}$ D) $\frac{7x}{36}$

80) $\frac{x^2 + 9x + 14}{x^2 + 4x + 4} \cdot \frac{x^2 + 10x + 16}{x^2 + 15x + 56}$ 80) _____

A) $\frac{1}{x + 8}$ B) 1 C) $\frac{x + 7}{x + 2}$ D) $\frac{x + 2}{x + 8}$

81) $\frac{12x - 12}{11} \div \frac{4x - 4}{33}$ 81) _____

A) 9 B) $\frac{3(12x - 12)}{4x - 4}$ C) $\frac{1}{9}$ D) $\frac{48(x - 1)^2}{363}$

Add or subtract as indicated.

82) $\frac{x^2 - 7x}{x - 5} + \frac{10}{x - 5}$ 82) _____

A) $x - 2$ B) $x + 2$ C) $x - 5$ D) $\frac{x^2 - 7x + 10}{x - 5}$

Simplify the complex rational expression.

83) $\frac{\frac{x}{1} - 1}{x - 1}$ 83) _____

A) $\frac{1}{x - 1}$ B) $\frac{1}{1}$ C) -1 D) $x - 1$

Solve the linear equation.

84) $7x - 8 = 55$ 84) _____

A) {9} B) {15} C) {56} D) {60}

85) $19t - 3 = 9t + 5$ 85) _____

A) $\left\{\frac{19}{2}\right\}$ B) $\left\{-\frac{4}{5}\right\}$ C) {14} D) $\left\{\frac{4}{5}\right\}$

86) $4(x + 5) + 13 = 5(x + 4) + 14$ 86) _____

A) {12} B) {7} C) {-1} D) {17}

87) $\frac{x}{7} = \frac{x}{9} + 8$ 87) _____

A) {252} B) {56} C) {72} D) {63}

88) $\frac{x + 4}{2} - 1 = \frac{x - 4}{6}$ 88) _____

A) $\left\{\frac{5}{2}\right\}$ B) {- 1} C) {- 5} D) $\left\{-\frac{31}{4}\right\}$

First, write the value or values of the variable that make a denominator zero. Then solve the equation.

89) $\frac{7}{x} = \frac{3}{2x} + 22$ 89) _____

A) 0, 2; $\left\{\frac{51}{22}\right\}$ B) none; {2} C) 0; {4} D) 0; $\left\{\frac{1}{4}\right\}$

Solve the formula for the specified variable.

90) $A = \frac{1}{2}bh$ for h 90) _____

A) $h = \frac{2A}{b}$ B) $h = \frac{Ab}{2}$ C) $h = \frac{A}{2b}$ D) $h = \frac{b}{2A}$

91) $F = \frac{9}{5}C + 32$ for C

91) _____

A) $C = \frac{9}{5}(F - 32)$ B) $C = \frac{5}{F - 32}$ C) $C = \frac{F - 32}{9}$ D) $C = \frac{5}{9}(F - 32)$

Solve the absolute value equation or indicate that the equation has no solution.

92) $|x - 2| - 5 =$

92) _____

A) {-5, 9} B) ∅ C) {9} D) {-9, 5}

93) $|x + 1| = 2$

93) _____

A) ∅ B) {-1, } C) {1} D) {-3, 1}

Solve the equation by factoring.

94) $x^2 = x + 20$

94) _____

A) {-4, -5} B) {-4, 5} C) {1, 20} D) {4, 5}

Solve the quadratic equation by the square root property.

95) $2x^2 = 50$

95) _____

A) {0} B) {-2, 2} C) $\{-5\sqrt{2}, 5\sqrt{2}\}$ D) {-5, 5}

96) $(2x - 5)^2 = 121$

96) _____

A) {-6, 16} B) {-16, 6} C) {-3, 8} D) {-8, 3}

Solve the quadratic equation using the quadratic formula.

97) $x^2 + 3x - 108 = 0$

97) _____

A) {-12, 1} B) {12, 9} C) {-9, 12} D) {-12, 9}

98) $2x^2 + 12x + 5 = 0$

98) _____

A) $\left\{\frac{-6 - \sqrt{26}}{4}, \frac{-6 + \sqrt{26}}{4}\right\}$ B) $\left\{\frac{-12 - \sqrt{26}}{2}, \frac{-12 + \sqrt{26}}{2}\right\}$

C) $\left\{\frac{-6 - \sqrt{26}}{2}, \frac{-6 + \sqrt{26}}{2}\right\}$ D) $\left\{\frac{-6 - \sqrt{46}}{2}, \frac{-6 + \sqrt{46}}{2}\right\}$

Solve the radical equation, and check all proposed solutions.

99) $\sqrt{x + 3} = 6$

99) _____

A) {81} B) {33} C) {39} D) {36}

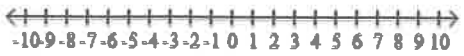
100) $\sqrt{x - 3} = x - 5$

100) _____

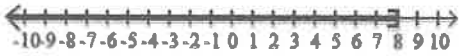
A) {4, 7} B) {4} C) {-7} D) {7}

Express the interval in set-builder notation and graph the interval on a number line.

101) (-8, 8] 101) _____

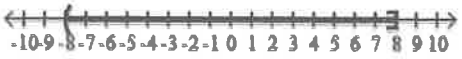


A) {x | x ≤ 8}



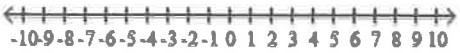
B) {x | -8 ≤ x ≤ 8}

C) {x | -8 < x ≤ 8}



D) {x | -8 < x < 8}

102) [-1, 9] 102) _____



A) {x | -1 ≤ x < 9}

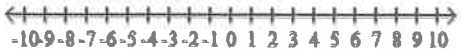
B) {x | -1 < x < 9}

C) {x | -1 ≤ x ≤ 9}

D) {x | -1 < x ≤ 9}

Solve the linear inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

103) 4x + 1 < 37 103) _____



A) (-∞, 9)

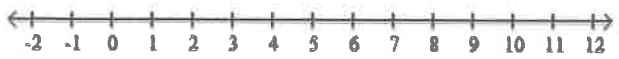
B) [9, ∞)

C) (-∞, 9]

D) (9, ∞)

Solve the compound inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

104) $8 < 2x \leq 10$ 104) _____



A) $(-\infty, 4) \cup [5, \infty)$

B) $(-\infty, 4] \cup (5, \infty)$

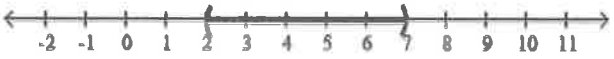
C) $(4, 5]$

D) $[4, 5)$

105) $-23 \leq -3x - 2 \leq -8$ 105) _____

A) $(-7, -2)$

B) $(2, 7)$

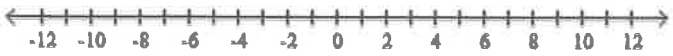


C) $[2, 7]$

D) $[-7, -2]$

Solve the absolute value inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

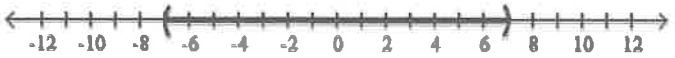
106) $|x - 7| < 0$ 106) _____



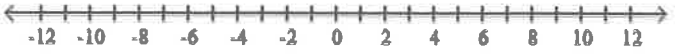
A) $(-7, \infty)$

B) $(-\infty, 7)$

C) $(-7, 7)$

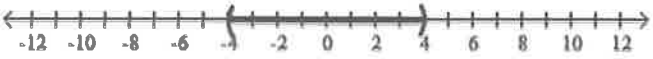


D) ∅

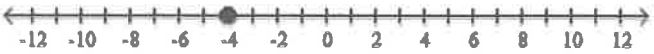


107) $|x + 4| \geq 0$ 107) _____

A) $(-4, 4)$



B) $\{-4\}$



C) $(-4, \infty)$

D) $(-\infty, \infty)$