

Algebra II
Exam Review *College Prep*

Name _____

Date _____

Try to answer all questions without using Mult. choices available. *Show all work.*

1. Finish the statement: "If a is a negative number, then \sqrt{a} is _____."

- a) a whole number b) rational
c) irrational d) not a real number
-

2. Find the value of $11\sqrt{27} - 6\sqrt{27}$.

- a) 5 b) $15\sqrt{3}$ c) $45\sqrt{3}$ d) $17\sqrt{37}$
-

3. What statement represents the Commutative Property of Addition?

- a) $7(a + b) = 7a + 7b$
b) $y + 2z = 2z + y$
c) $(11 + x) + 8 = 11 + (x + 8)$
d) $a + 0 = a$
-

4. What property justifies the statement $17 + (-17) = 0$?

- a) Additive Property of Equality
b) Additive Inverse Property
c) Multiplicative Identity Property
d) Additive Identity Property
-

5. What property justifies the statement, "If $x(x + 4) = 0$, then $x = 0$ or $x + 4 = 0$ "?

- a) Additive Property of Equality
b) Zero Product Property
c) Multiplicative Property of Zero
d) Additive Inverse Property
-

6. Which expression demonstrates the Distributive Property?

- a) $a(bc) = ab + bc$
b) $4 \cdot (3 + \sqrt{7}) = 4 \cdot 3 + 4 \cdot \sqrt{7}$
c) $3x \cdot 4y + 4 = (3x \cdot 4y) + 4$
d) $4a^2 - b^2 = (2a - b)(2a + b)$
-

7. Simplify the expression

$$(a^2 + 2a - 6) - (3a^2 + 4a - 1).$$

- a) $-2a^2 + 6a - 7$ b) $4a^2 + 6a - 5$
c) $-2a^2 - 2a - 5$ d) $-2a^2 + 6a - 5$
-

8. Find the expression equivalent to $(11r^{11}t^3)^2$.

- a) $22r^{13}t^5$ b) $22r^{22}t^6$
c) $121r^{13}t^5$ d) $121r^{22}t^6$
-

9. Simplify the expression $\frac{14x^2y^2z^2}{21xy^8z^4}$.

- a) $\frac{x^2}{7y^4z^2}$ b) $\frac{x}{7y^6z^2}$ c) $\frac{2x}{3y^6z^2}$ d) $7xy^8z^2$
-

10. Simplify: 3^{-3}

- a) -27 b) $\frac{1}{27}$ c) 54 d) 27
-

11. Write the expression $\frac{x^{-6}}{x^9}$ without a negative exponent.

- a) $-\frac{1}{x^{15}}$ b) $-\frac{1}{x^3}$ c) $\frac{1}{x^{15}}$ d) x^{15}
-

12. Which expression is equivalent to $-7t^3(2t^2 - 3)$?

- a) $-14t^5 + 21t^3$ b) $35t^5$
 c) $9t^5 + 10t^3$ d) $14t^5 + 21t^3$
-

13. Simplify the expression $(3x + 2)(x^2 - 5x - 6)$.

- a) $x^2 - 2x - 4$
 b) $3x^3 - 13x^2 - 28x - 12$
 c) $3x^3 - 15x^2 - 18x - 12$
 d) $x^3 - 10x^2 - 10x - 12$
-

14. Simplify: $\frac{30x - 45}{5}$

- a) $6x - 45$ b) $30x - 9$
 c) $6x - 9$ d) $25x - 40$
-

15. Find the expression that is equivalent to $(x - 7)^2$.

- a) $2x - 14$ b) $2x + 49$
 c) $x^2 + 49$ d) $x^2 - 14x + 49$
-

16. Factor the polynomial $ab + 2a + 5b + 10$ completely.

- a) $(a + 5)(b + 2)$ b) $a(2 + b) + 5(b + 2)$
 c) $(a - 2b)(5a + b)$ d) $(a + 2)(b + 5)$
-

17. Factor the polynomial $21c^2 + 19c - 12$ completely.

- a) $(7c + 3)(3c + 4)$ b) $(7c - 3)(3c + 4)$
 c) $(7c - 6)(3c + 2)$ d) prime polynomial
-

18. Factor $w^2 - 13w - 30$ completely.

- a) $(w - 3)(w - 10)$ b) $(w + 2)(w - 15)$
 c) $(w + 3)(w - 10)$ d) $(w - 2)(w - 15)$
-

19. Factor completely: $9g^2 - 6gh + h^2$

- a) $(3g - h)^2$ b) $(3g - h)(g + h)$
 c) prime d) $(9g - h)(g + h)$
-

20. Factor $z^2 - 169$ completely.

- a) $(z - 16)(z - 9)$ b) $(z - 13)(z - 13)$
 c) $(z + 13)(z - 13)$ d) $(z + 16)(z - 9)$

21. Factor completely: $27y^3 - 64$

- a) $(3y - 4)^3$
 b) $(3y - 4)(9y^2 + 12y + 16)$
 c) $(3y - 4)(3y^2 + 12y + 16)$
 d) $(3y - 4)(9y^2 - 24y + 16)$

22. Factor the expression $2x^2 - 32$ completely.

- a) $(2x + 8)(x - 4)$ b) $(x + 4)(2x - 8)$
 c) $2(x + 4)(x - 4)$ d) $2(x + 8)(x - 8)$

23. Solve the equation $3(2p + 4) - 7 = 5(2p + 2) - 4p$.

- a) $\frac{3}{5}$ b) $\frac{5}{3}$
 c) 5 d) no solution

24. Find the solutions for $z^2 = 3z + 40$.

- a) -4, 10 b) -8, 5 c) 8, -5 d) -8, -5

25. Solve: $2c^2 = -3c$

- a) $0, -\frac{3}{2}$ b) $10, \frac{5}{2}$ c) 15, 4 d) 18, 6

26. Which equation below has the solutions $x = 4$ or $x = 5$?

- a) $x^2 - 9x + 20 = 0$ b) $x^2 - 4x + 25 = 0$
 c) $x^2 + 9x - 20 = 0$ d) $x^2 + 9x + 25 = 0$

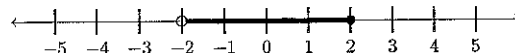
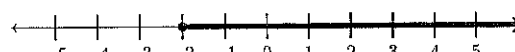
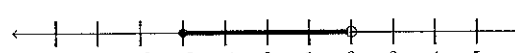
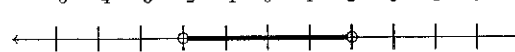
27. Which of the following is the quadratic formula for all real values of a , b , and c where $a \neq 0$?

- a) $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ b) $x = \frac{b \pm \sqrt{b^2 + 4ac}}{2c}$
 c) $x = \frac{-b \pm \sqrt{b^2 - 4a}}{2ac}$ d) $x = \frac{b \pm \sqrt{b^2 - 4ac}}{2a}$

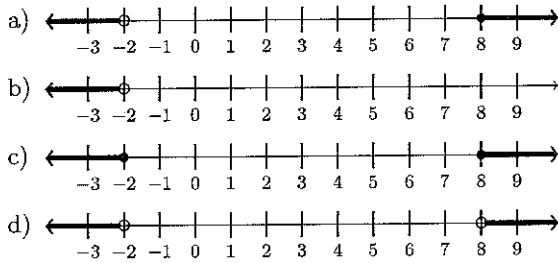
28. Solve: $5(2x + 1) > 2(4x + 6)$

- a) $x > \frac{5}{2}$ b) $x > 3$ c) $x > \frac{7}{2}$ d) $x > 7$

29. Which of the following is the graph of the compound inequality $-5 < 3x + 1 \leq 7$?

- a) 
 b) 
 c) 
 d) 

30. Which of the following is the graph of the compound inequality $2 - 3x > 8$ or $3x - 15 > 9$?



31. Solve the inequality $|4x + 7| < 21$.

- a) $-\frac{7}{2} < x < 8$ b) $-7 < x < -\frac{7}{2}$
 c) $-7 < x < \frac{7}{2}$ d) no solution exists

32. Solve: $|2x + 7| > 11$

- a) $x < -9$ b) $x > 2$ or $x < -9$
 c) $x < -2$ or $x > 9$ d) no solution exists

33. In the equation $d = rt$ solve for t .

- a) $t = dr$ b) $t = d - r$
 c) $t = \frac{d}{r}$ d) $t = \frac{d}{t}$

34. If there is no solution to a system of two linear equations, then the graphs of the equations could be _____.

- a) two perpendicular lines
 b) two parallel lines
 c) two lines that do not intersect
 d) a single line

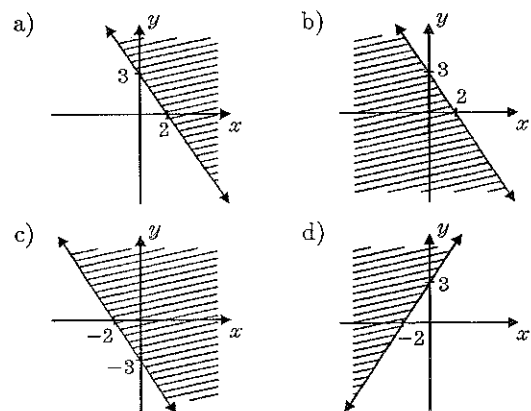
35. If $y = 2x$ and $x + y = 6$, find the value of x .

- a) 0 b) 1 c) 2 d) 4

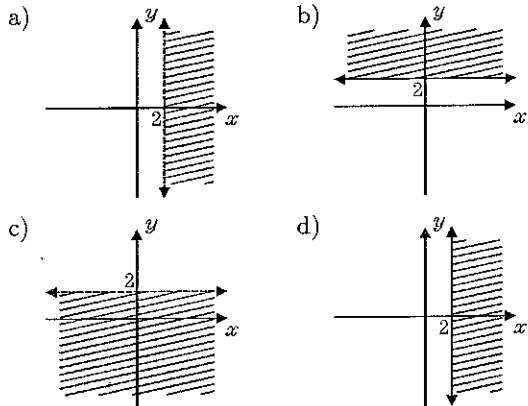
36. Solve the system: $-2x + y = 5$
 $-6x - 2y = -5$

- a) $(-2, -4)$ b) $(-\frac{5}{2}, -\frac{1}{4})$
 c) $(\frac{1}{2}, -4)$ d) $(-\frac{1}{2}, 4)$

37. Which graph represents the inequality $3x + 2y \leq 6$?



38. Which graph represents the inequality $x \geq 2$?



39. In the ordered pair (x, y) the value x is said to be an element from the _____.

- a) relation b) function
c) domain d) graph

40. In the ordered pair (x, y) , the element from the range of the relation is _____.

- a) y
b) both x and y
c) x only if x is positive
d) y only if y is positive

41. A set of ordered pairs in which each first component corresponds to exactly one second component is called a _____.

- a) relation b) function
c) range d) graph

42. A function is a relation where _____.

- a) each value in the range corresponds to one value in the domain
b) each value in the domain corresponds to one value in the range
c) the value in the domain equals the value in the range
d) the value in the domain never equals the value in the range

43. Which of the following relations is not a function?

I.

x	2	-1	7	-1
y	9	2	0	3

II.

x	5	-7	-1	3
y	6	9	0	6

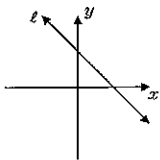
III.

x	9	1	5	11
y	3	2	6	12

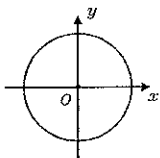
- a) I only b) II only
c) III only d) I and III only

44. Determine which of the following graphs is a function.

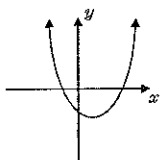
I.



II.



III.



- a) II only b) III only
c) I and III only d) II and III only

45. If $a(n) = 3 + (n - 1) \cdot 9$, find the functional value $a(8)$.

- a) 60 b) 66 c) 78 d) 82

46. In the symbol $\sqrt[n]{\quad}$, the n is called the _____.

- a) root index b) radical
c) square root d) divisor

47. Which expression is equivalent to $\sqrt{\frac{48x^2y^5}{25z^4}}$?
(Assume that all variables are positive.)

- a) $\frac{4xy^2\sqrt{3y}}{5z^2}$ b) $\frac{8xy^2\sqrt{3y}}{5z^2}$
c) $\frac{4x^2y^2\sqrt{3y}}{5z^2}$ d) $\frac{16xy^2\sqrt{3y}}{25z^2}$

Solve.

48. Simplify the radical $\sqrt{\frac{36}{49}}$.

- a) $\frac{3}{7}$ b) $\frac{6}{8}$ c) $\frac{6}{7}$ d) $\frac{8}{9}$

49. Simplify: $3\sqrt{12} - 5\sqrt{6} + 2\sqrt{24}$

- a) $3\sqrt{3} + 3\sqrt{6}$ b) $6\sqrt{3} - \sqrt{6}$
c) $9\sqrt{3} - 3\sqrt{6}$ d) $12\sqrt{3} - \sqrt{6}$

50. Simplify: $8\sqrt[3]{54} + 5\sqrt[3]{16}$

- a) $13\sqrt[3]{2}$ b) $18\sqrt[3]{2}$ c) $29\sqrt[3]{2}$ d) $34\sqrt[3]{2}$

51. Simplify: $\sqrt{2nm^5} \cdot \sqrt{8n^3m^3}$ (Assume that all variable expressions are positive.)

- a) $2n^2m^4$ b) $4n^2m^4$
c) $5n^4m^8$ d) $16n^4m^8$

52. Simplify: $\sqrt{\frac{3}{4}} \cdot \sqrt{\frac{5}{6}}$

- a) $\frac{\sqrt{6}}{4}$ b) $\frac{4}{\sqrt{10}}$ c) $\frac{\sqrt{10}}{4}$ d) $\frac{\sqrt{5}}{2}$

53. Simplify the expression $\sqrt{\frac{2x^2z^4}{3y}}$. (Assume that all variable expressions are positive.)

- a) $\frac{xz\sqrt{3y}}{6y}$ b) $\frac{8xz\sqrt{3y}}{6y}$
 c) $\frac{xz^2\sqrt{6y}}{3y}$ d) $\frac{2x^2z^2\sqrt{3y}}{6y}$

54. Simplify the expression $\frac{5}{2 + \sqrt{5}}$.

- a) $-12 - 2\sqrt{5}$ b) $-10 + 5\sqrt{5}$
 c) $20 + 7\sqrt{3}$ d) $\frac{32 + 14\sqrt{5}}{2}$

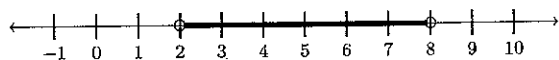
55. Solve the equation $\sqrt{k} - 2 = 5$.

- a) 16 b) 25 c) 36 d) 49

56. What is the solution to the equation $\sqrt{3n + 4} = 2\sqrt{4}$?

- a) 4 b) 10 c) 12 d) 20

57. Which absolute value inequality is equivalent to the solution shown by the number line graph?



- a) $|5 - x| < 6$ b) $|x - 5| < 6$
 c) $|x + 5| < 3$ d) $|x - 5| < 3$

Factor.

58. $24a^2 - 8a^4 + 28a^6$

59. $3a^2 + 14a + 15$

60. $n^2 - 16n + 64$

61. $7a - 7b + a^2 - ab$

62. $b^3 + 8$

63. $125c^3 - w^3$

Solve.

64. $3|g - 11| = 33$

65. $\frac{-2c}{3} < 9$

Simplify.

66. $\sqrt[3]{8a^3}$

67. $\sqrt{23} \cdot \sqrt{23}$

68. $\sqrt{8a} \cdot \sqrt{12a^6}$

Rewrite without any exponents.

69. $2^{\frac{1}{2}}$

Express in terms of i .

70. $\sqrt{-40}$

71. $\sqrt{\frac{-1}{36}}$

Simplify.

72. $(12 - 11i) + (4 - 9i)$

73. $(12 + 4i) - (7 + 2i)$

74. $-5(4 - 7i)$

Find the product of the number and its conjugate.

75. $9 - 3i$

Solve.

76. $c^2 = 10$

77. $a^2 - a + 1 = 0$

78. $x + y = -2$
 $3x + y = 4$

Simplify, using scientific notation.

79. $\frac{8.1 \times 10^4}{2.7 \times 10^{-4}}$

Fill in each blank with the correct symbol (<, >, or =).

80. $-16\sqrt{4}$ ___ $-4\sqrt{16}$

Simplify.

81. $(w - 6)(w + 6) + (5w - 1)(2w + 3)$

82. The polynomial $(3x^2y^3 - 7x^5y^2 + 8y^6)$ is what degree?

Solve by completing the square.

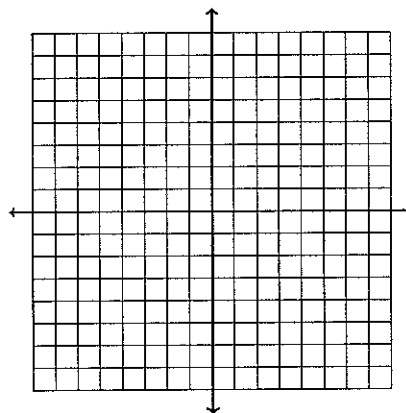
83. $w^2 + 18w + 80 = 0$

Find the x - and y -intercepts for each line.

84. $10x + 2y = -20$

Graph.

85. $-x + 5y + 15 = 0$



86. Write the equation of the line that contains $(-12, 5)$ and is perpendicular to the line $y = 3x + 6$.

Simplify.

87. $\frac{\sqrt[3]{750}}{\sqrt[3]{3}}$

88. i^{29}

89. $\frac{-5}{6i}$

Solve for the indicated variable.

90. $p^2 + 32 = 128$

Solve.

91. $0 = p^2 + 6p + 1$

92. Find the reciprocal of $-9 + 2i$.

93. Solve the equation $P = 2\ell + 2w$ for w .

$$\begin{array}{ll} \text{a) } w = P - 2\ell - 2 & \text{b) } w = \frac{P}{2} - \frac{\ell}{4} \\ \text{c) } w = \frac{P - 2\ell}{2} & \text{d) } w = \frac{P - \ell}{4} \end{array}$$

94. Solve for F in the equation $C = \frac{5}{9}(F - 32)$

$$\begin{array}{ll} \text{a) } F = 32 - \frac{9}{5}C & \text{b) } F = C + \frac{32}{5} \\ \text{c) } F = \frac{9}{5}C + 32 & \text{d) } F = \frac{5}{9}C - 32 \end{array}$$

95. If a system of two equations is independent, then the graphs of the two equations _____.

- a) are parallel lines
- b) are perpendicular lines
- c) do not intersect
- d) intersect at one point

96. Find the vertex and axis of symmetry for the parabola $y = 4x^2 + 8x + 6$.

- a) $(-1, 1)$; $x = -1$
- b) $(1, 0)$; $x = 0$
- c) $(-1, 2)$; $x = -1$
- d) $(10, 1)$; $x = 10$

97. Find the x -intercepts of the parabola $y = x^2 - 2x - 15$.

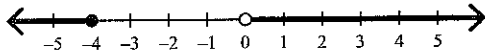
- a) $(-2, 0)$, $(8, 0)$
- b) $(-3, 0)$, $(5, 0)$
- c) $(-7, 0)$, $(2, 0)$
- d) $(-9, 0)$, $(1, 0)$

98. Write the equation of the parabola that opens up, has a vertex $V(2, -3)$, and is congruent to $y = x^2$. Answer in the form $y = a(x - h)^2 + k$.

- a) $y = (x - 2)^2 + 3$
- b) $y = (x + 2)^2 + 3$
- c) $y = (x - 2)^2 - 3$
- d) $y = 2x^2 - 3$

Exam Review Continued

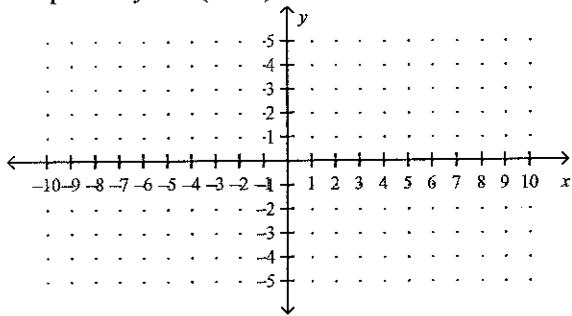
99. Which interval notation matches the following graph?



- a. $(-\infty, -4) \cup (0, \infty)$
- b. $(-\infty, \infty)$
- c. $(-\infty, -4] \cup (0, \infty)$
- d. $[-4, 0)$

For the next two questions, use interval notation. When asked to determine increasing or decreasing, find the interval on which the domain values are increasing or decreasing.

100. Graph of: $y = -(x-2)^2 + 4$.



- What is the domain? _____
- What is the range? _____
- Increasing? _____
- Decreasing? _____
- What are the x-intercepts? _____
- What is another name for the x-intercepts?

- What is the y-intercept? _____

101. Graph $y = \frac{1}{2}|x-3| - 7$ on your graphing calculator.
What is the domain? _____

What is the range? _____

Increasing? _____

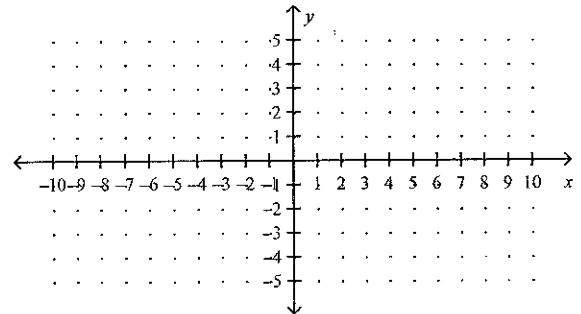
Decreasing? _____

102. Solve the following system by your choice of

$$\text{methods: } \begin{cases} y = -x^2 + 4x + 4 \\ y = 2x - 4 \end{cases}$$

Solution: _____

103. Solve by graphing: $\begin{cases} y < 2x + 1 \\ y \geq x \end{cases}$



104. Solve by graphing: $\begin{cases} y < \frac{1}{2}|x| - 3 \\ y \leq -x^2 + 5 \end{cases}$

