

Summer Prep for Honors Analysis**Solve the compound inequality.**

_____ 1. $x - 3 \leq 5$ or $x + 4 \geq 14$

- a. $x \leq 8$
- b. $x \leq 8$ or $x \geq 10$
- c. $x \geq 10$
- d. $8 \leq x \leq 10$

2. $-5 < -2h - 15 < 7$

Solve the absolute value equation.

_____ 3. $|5a + 3| = 5$

a. $1, -1$

b. $\frac{2}{5}, \frac{8}{5}$

c. $\frac{2}{5}, -\frac{8}{5}$

d. $1, 2$

Solve the absolute value inequality.

_____ 4. $|m - 2| > 1$

a. $1 \leq m \leq 3$

b. $m \leq 1$ or $m \geq 3$

c. $1 < m < 3$

d. $m < 1$ or $m > 3$

_____ 5. $|z + 3| \leq 7$

a. $-10 \leq z \leq 4$

b. $-10 < z < 4$

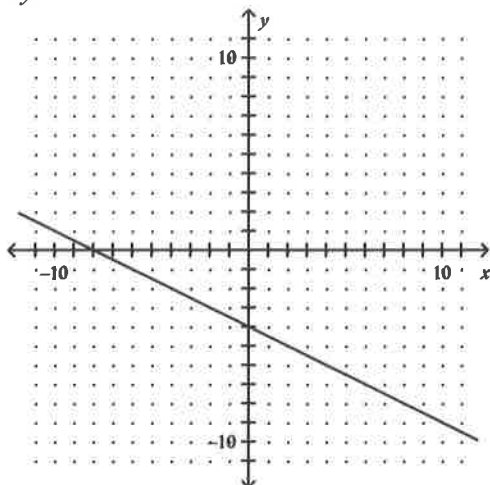
c. $z < -10$ or $z > 4$

d. $z \leq -10$ or $z \geq 4$

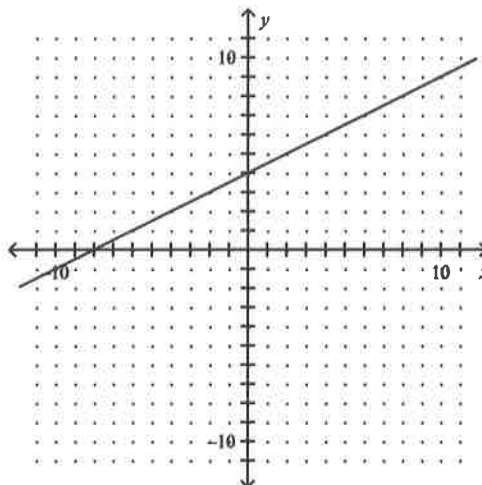
Graph the equation.

6. $4x + 8y = 32$

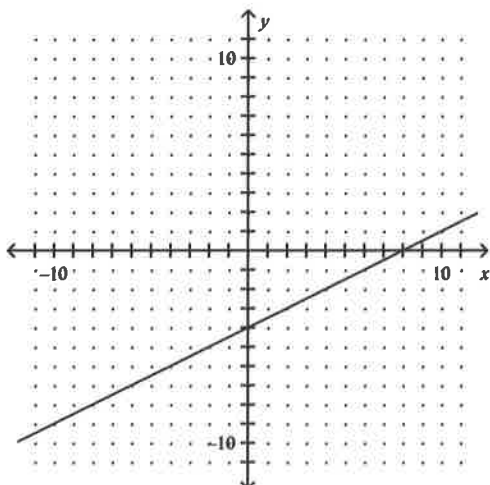
a.



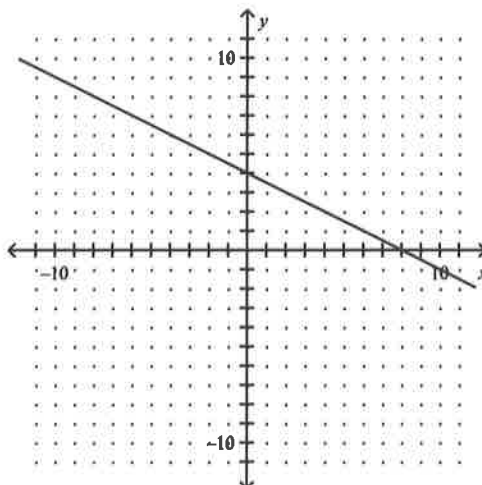
c.



b.



d.

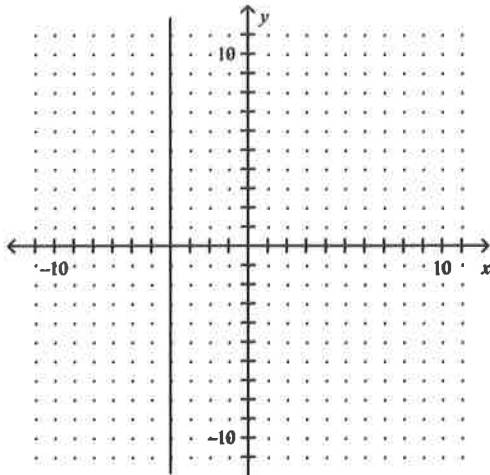


7. Find the slope and y -intercept of the graph of $5x - 4y = 20$.

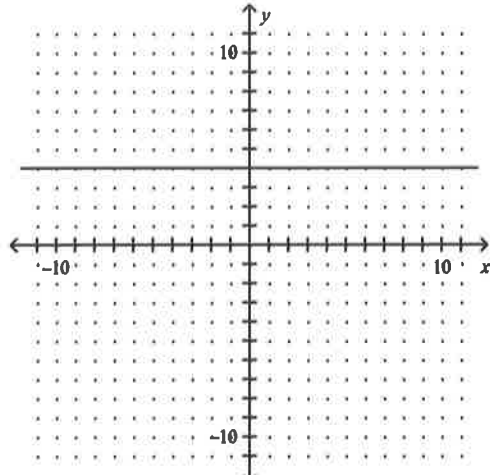
Identify the graph of the linear equation.

8. $y = 4$

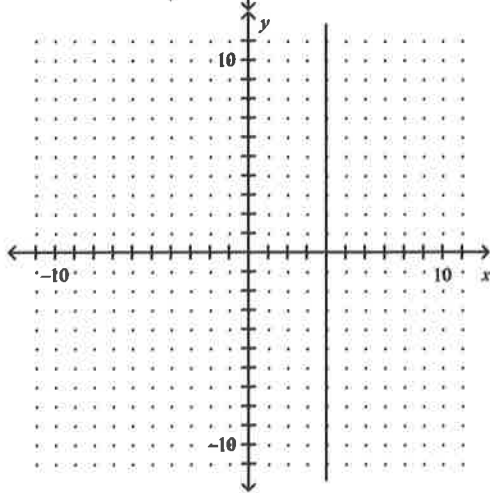
a.



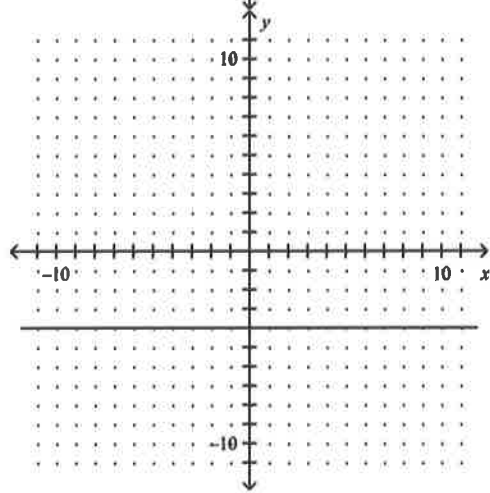
c.



b.



d.



9. Find the slope of the line passing through the points $(5, 7)$ and $(-4, 2)$.

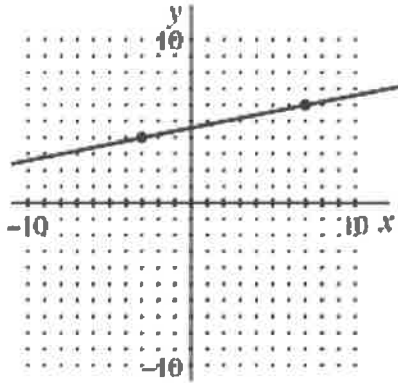
a. $\frac{9}{5}$

c. $\frac{1}{9}$

b. 9

d. $\frac{5}{9}$

- ____ 10. Find the slope of the line.



- a. $\frac{5}{2}$ b. 5 c. $\frac{2}{5}$ d. $\frac{1}{5}$

11. Line 1 contains $(-3, 5)$ and $(2, 0)$. Line 2 contains $(1, -3)$ and $(-1, 3)$. Are the lines parallel, perpendicular, or neither?

- ____ 12. Which slope-intercept equation represents a line that passes through the point $(1, -5)$ and is parallel to the line $y = -4x - 5$?

- a. $y = 4x + 1$ c. $y = -\frac{1}{4}x - 5$
b. $y = -4x - 1$ d. $y = -4x - 21$

Choose the equation of the line that is perpendicular to the given line and passes through the given point.

- ____ 13. $y = \frac{2}{3}x + \frac{4}{5}; \left(0, -\frac{9}{2}\right)$

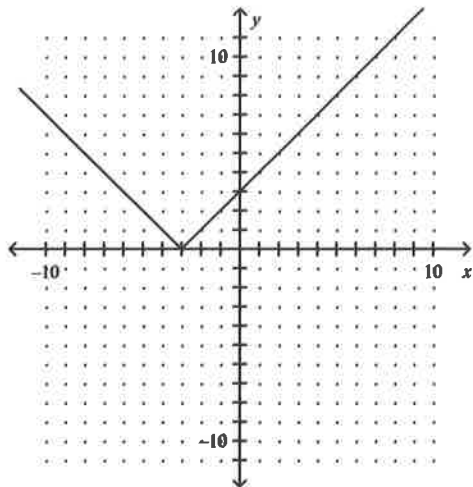
- a. $y = -\frac{3}{2}x + \frac{9}{2}$ c. $y = -\frac{3}{2}x - \frac{9}{2}$
b. $y = \frac{2}{3}x - \frac{32}{3}$ d. $y = \frac{2}{3}x + \frac{32}{3}$

Name: _____

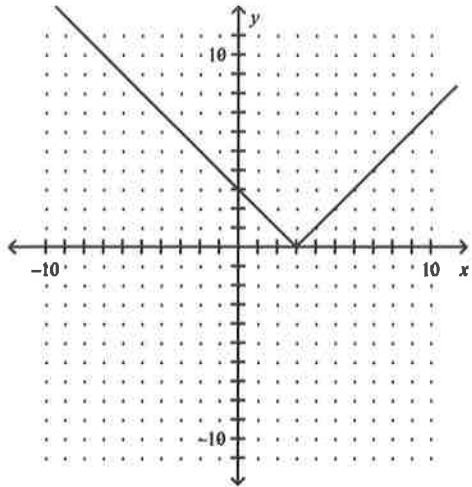
ID: A

14. Graph the function defined by $y = |x + 3|$.

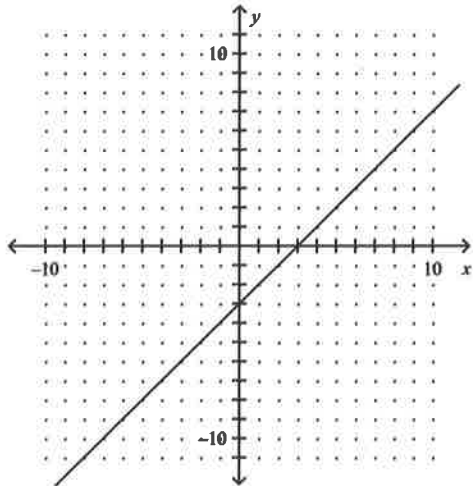
a.



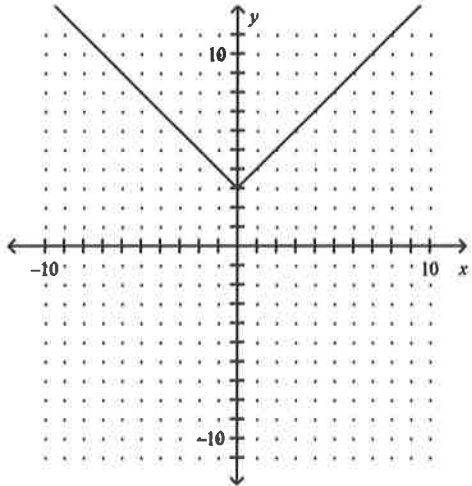
c.



b.



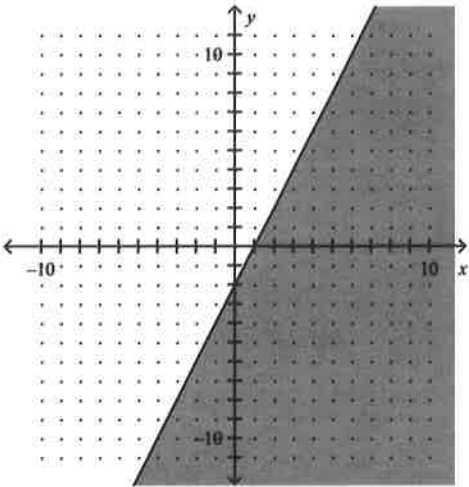
d.



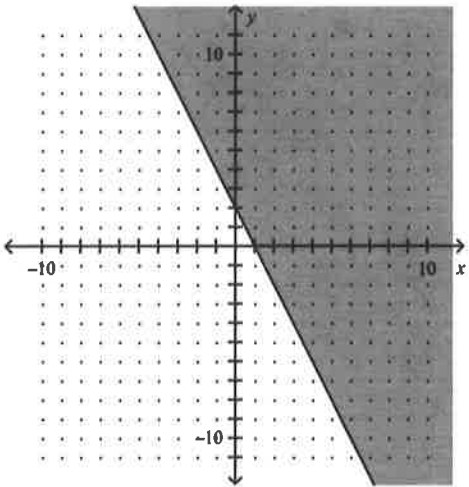
Graph the inequality in a coordinate plane.

15. $y \leq 2x - 2$

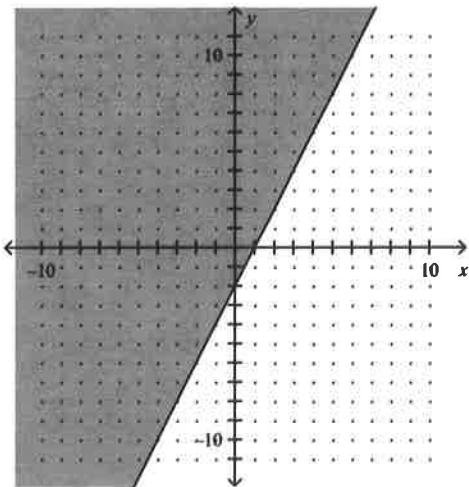
a.



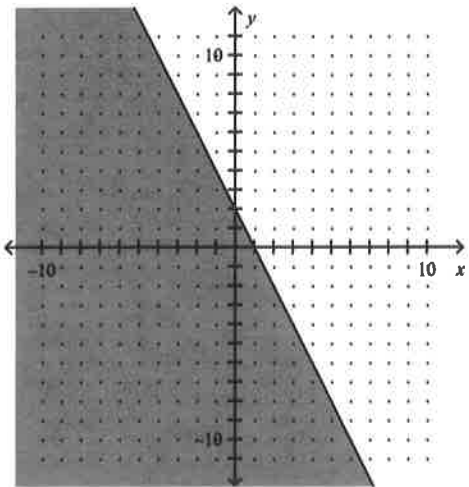
c.



b.



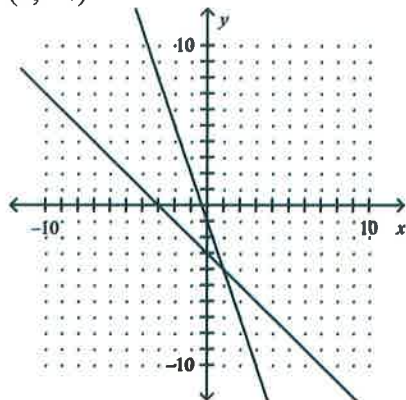
d.



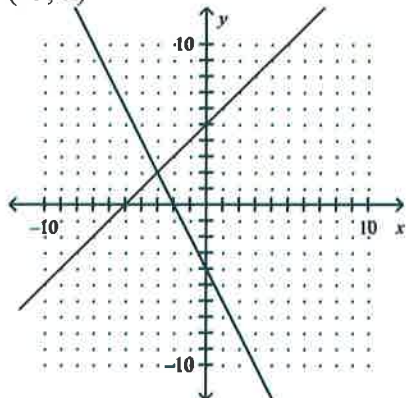
Graph the linear system and estimate the solution.

16. $x + y = -4$
 $3x + y = -6$

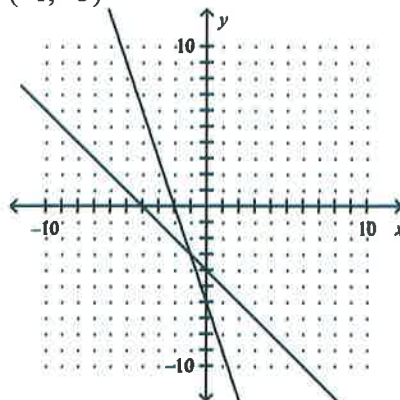
a. $(1, -4)$



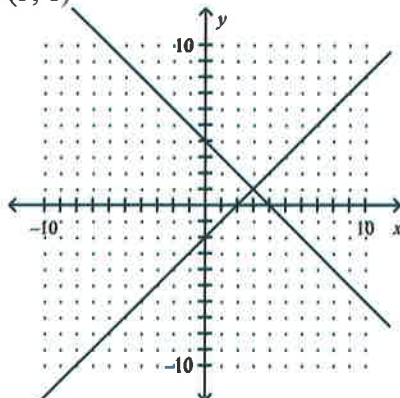
b. $(-3, 2)$



c. $(-1, -3)$



d. $(3, 1)$



17. The drama club sold 1500 tickets for the end-of-year performance. Admission prices were \$12 for adults and \$6 for students. The total amount collected at the box office was \$15,600. How many students attended the play?

Solve the linear system.

18. $-4x - 3y = -27$
 $-4x + 4y = 8$

a. $(-5, -5)$
b. $(-1, -5)$

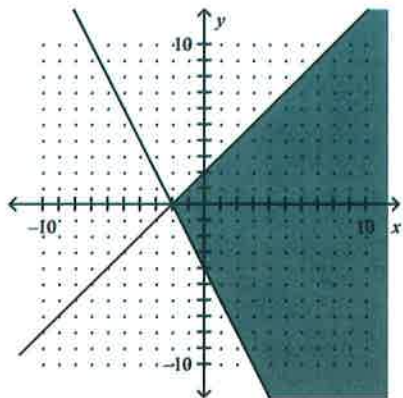
c. $(3, 5)$
d. no solution

19. $2x + 5y = -2$
 $3x - 2y = 4$

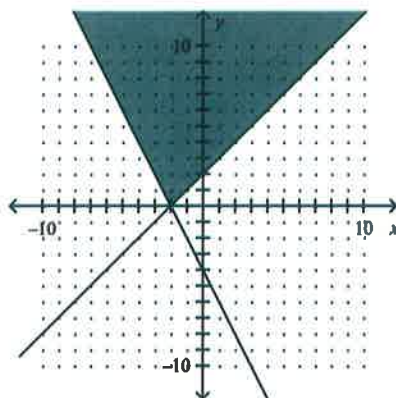
Graph the system of inequalities.

20. $y \leq -2x - 4$
 $y \geq x + 2$

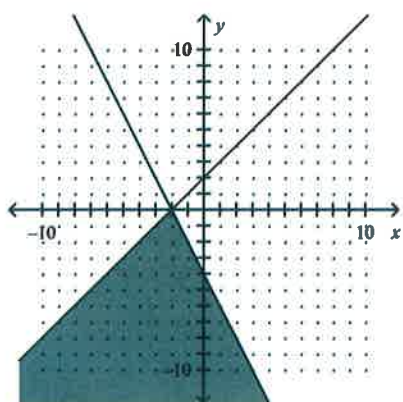
a.



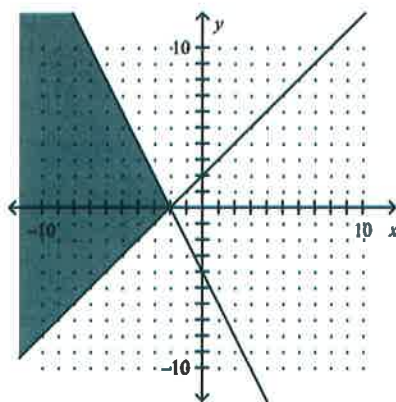
c.



b.

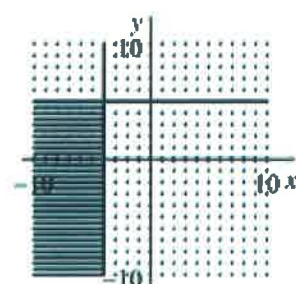


d.

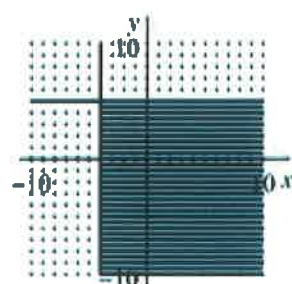


21. $x \geq -4$
 $y \leq 5$

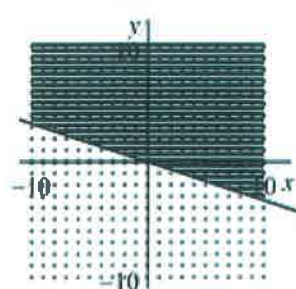
a.



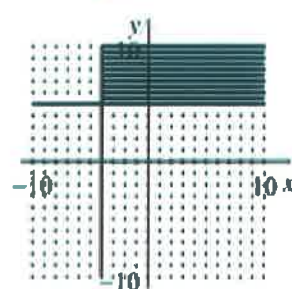
c.



b.



d.



Solve the system of equations.

22. $4x + 2y + z = 10$
 $-6x - y - 5z = -34$
 $3x + 3y + 6z = 9$

23. Find the *vertex* and the *axis of symmetry* of the parabola. $y = 3x^2 + 12x + 9$

24. Sketch the graph of the equation. $y = x^2 - 2x + 3$

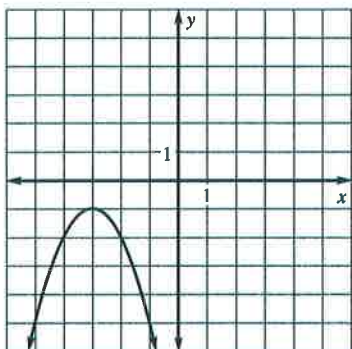
Find the maximum value or minimum value for the function.

25. $f(x) = 4x^2 + 6x + 3$

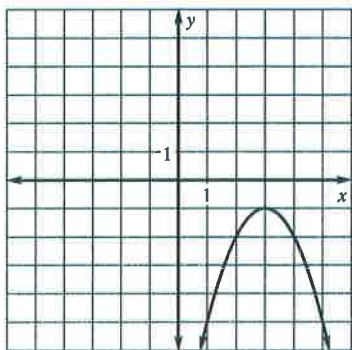
Graph.

_____ 26. $y = -(x - 3)^2 - 1$

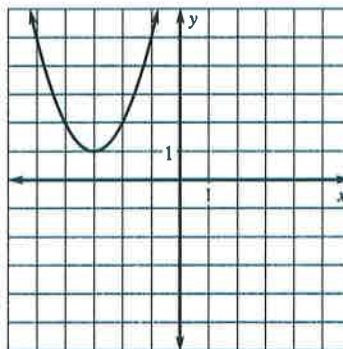
a.



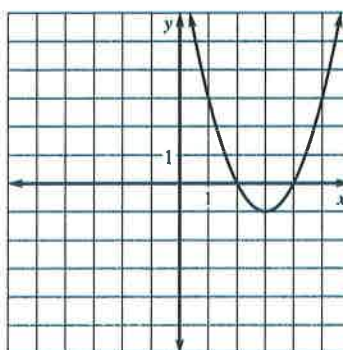
b.



c.



d.



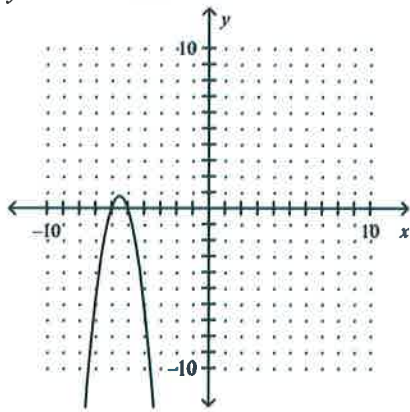
Name: _____

ID: A

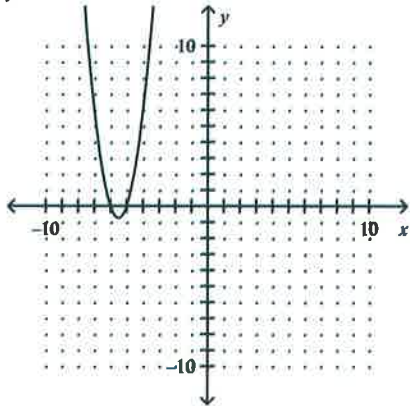
Write in standard form and graph.

27. $y = 3(x - 5)(x - 6)$

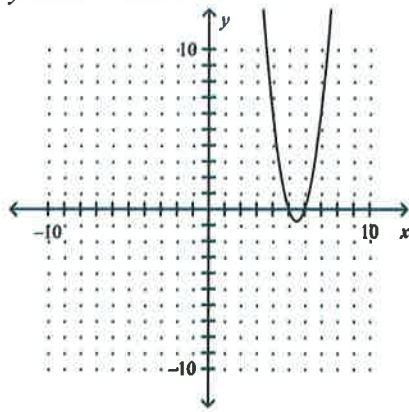
a. $y = 3x^2 - 11x + 30$



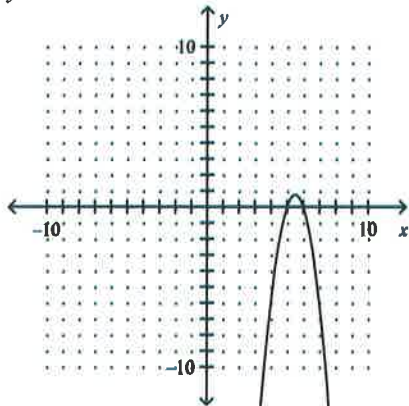
b. $y = 3x^2 - 11x + 30$



c. $y = 3x^2 - 33x + 90$



d. $y = 3x^2 - 33x + 90$



28. Solve by factoring: $x^2 - 18x + 81 = 0$

29. What are the solutions of the equation?

$x^2 = 11x - 24$

a. $x = -1$ or $x = -24$

b. $x = 3$ or $x = 8$

c. $x = -3$ or $x = -8$

d. $x = -1$ or $x = 24$

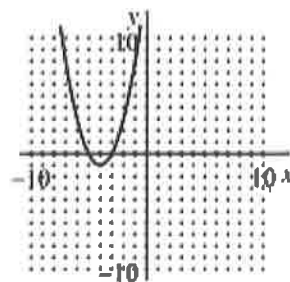
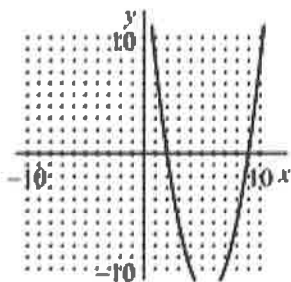
Name: _____

ID: A

30. Find the x -intercepts of the graph of $y = x^2 - 11x + 18$.

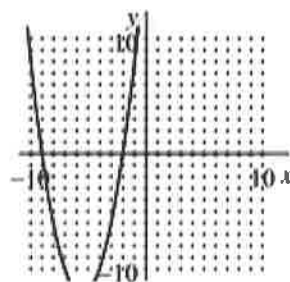
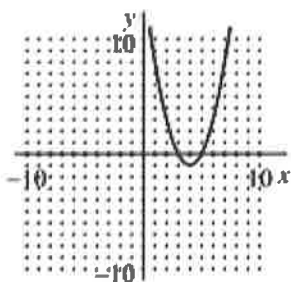
a. 2, 9

c. -3, -5



b. 3, 5

d. -2, -9



Factor the expression.

31. $35x^2 + 26x - 16$

a. $(7x - 2)(5x + 8)$

c. $(5x - 2)(7x + 8)$

b. $(7x + 2)(5x - 8)$

d. $(5x + 2)(7x - 8)$

32. $16x^2 - 25$

Solve.

33. $63x^2 + 76x + 21 = 0$

a. $\frac{7}{9}, -\frac{3}{7}$

c. $1, -\frac{1}{3}$

b. $-1, -\frac{1}{3}$

d. $-\frac{7}{9}, -\frac{3}{7}$

Find the zeros of the function if y is a function of x .

_____ 34. $4x^2 - 5x = 21 + y$

a. $x = -7$ and $x = \frac{3}{4}$

b. $x = 3$ and $x = -\frac{7}{4}$

c. $x = -7$ and $x = -\frac{3}{4}$

d. $x = -3$ and $x = -\frac{7}{4}$

Solve.

_____ 35. $8x^2 + 23 = 823$

a. no real-number solution

b. $\pm\sqrt{800}$

c. $\pm\sqrt{64}$

d. ± 10

36. Solve the equation. $4x^2 + 20 = 0$

Write the expression as a complex number in standard form.

_____ 37. $(-3 - 8i) + (-5 - 7i)$

a. $2 + 15i$

b. $2 - 15i$

c. $-8 + 15i$

d. $-8 - 15i$

38. $(-3 + 7i)(1 - 2i)$

39. $(3 - 2i)^2$

_____ 40. $\frac{8+7i}{3-4i}$

a. $\frac{4}{25} + \frac{53}{25}i$

b. $\frac{52}{7} - \frac{11}{7}i$

c. $\frac{52}{7} + \frac{53}{7}i$

d. $\frac{4}{25} - \frac{11}{25}i$

Solve.

_____ 41. $(11x + 7)^2 = 105$

a. $\frac{-7 - \sqrt{105}}{11}, \frac{-7 + \sqrt{105}}{11}$

b. $\frac{7 - \sqrt{105}}{22}, \frac{7 + \sqrt{105}}{22}$

c. $\frac{7 - \sqrt{105}}{11}, \frac{7 + \sqrt{105}}{11}$

d. $\frac{-7 - \sqrt{105}}{22}, \frac{-7 + \sqrt{105}}{22}$

____ 42. Use the quadratic formula to solve: $x^2 + 5x + 1 = 0$

a. $\frac{5 + \sqrt{21}}{2}, \frac{5 - \sqrt{21}}{2}$

c. $\frac{-5 + \sqrt{21}}{2}, \frac{-5 - \sqrt{21}}{2}$

b. $\frac{5 + \sqrt{29}}{2}, \frac{5 - \sqrt{29}}{2}$

d. $\frac{-5 + \sqrt{29}}{2}, \frac{-5 - \sqrt{29}}{2}$

43. Use the discriminant to determine the number of real solutions of the equation. $5x^2 - 3x + 1 = 0$ **Solve the inequality algebraically.**____ 44. $x^2 + 8x \geq 20$

a. $x \leq -2$ or $x \geq 10$

c. $-2 \leq x \leq 10$

b. $-10 \leq x \leq 2$

d. $x \leq -10$ or $x \geq 2$

45. $x^2 + x - 72 < 0$ **Simplify the expression.**____ 46. $\left(-3c^3d^4e^6\right)^2$

a. $-9c^6d^8e^{12}$

b. $9c^5d^6e^8$

c. $-9c^5d^6e^8$

d. $9c^6d^8e^{12}$

47. $\frac{12x^{-3}}{y^4} \cdot \frac{\left(y^{-2}x^2\right)^{-1}}{15x^{-2}}$

____ 48. Use synthetic substitution to evaluate $f(x) = 7x^3 + 3x^2 - 7x + 3$ when $x = 3$.

a. $f(x) = 216$

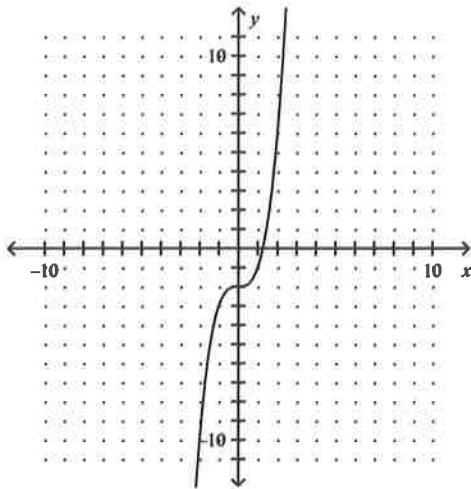
c. $f(x) = 195$

b. $f(x) = 63$

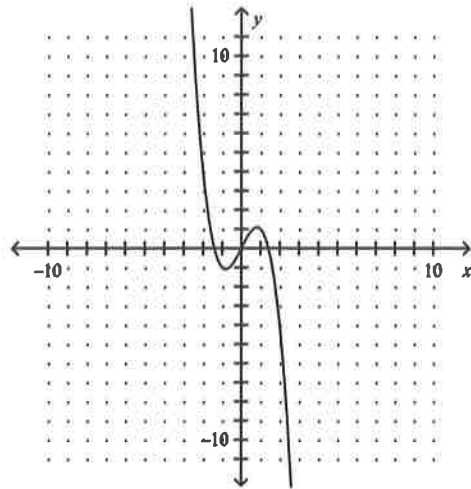
d. $f(x) = 198$

49. Which is the graph of the function $f(x) = x^3 - 2x$?

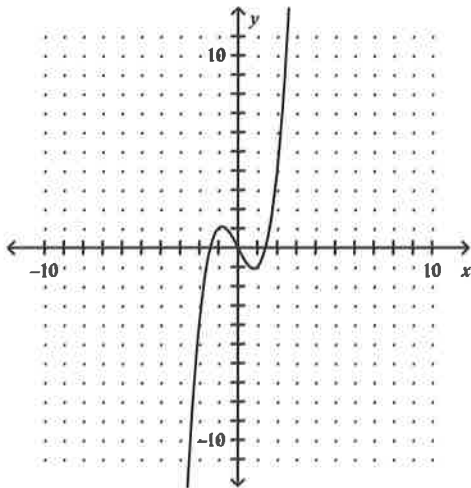
a.



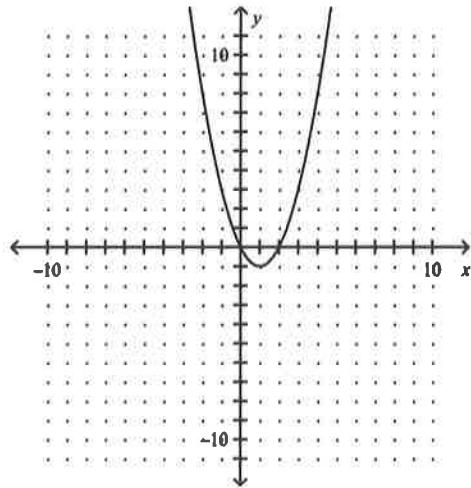
c.



b.



d.



Decide whether the function is a polynomial function. If so, state its degree, type, and leading coefficient.

50. $f(x) = x^4 - x^2 + 3x - 7$

51. Evaluate the polynomial function when $y = 5$: $f(y) = 8y^3 - 2y^2 - 3y - 5$

Find the sum or difference.

52. $(5h^3 + 8h - 9) - (6h^3 + 6h - 4)$

a. $-h^3 + 2h - 5$

b. $-h^3 + 2h - 13$

c. $-h^3 + 14h - 13$

d. $-h^3 - 2h - 5$

Find the product.

____ 53. $(u+4)(u^2-3u+3)$

a. $u^3 + u^2 + 15u + 12$

b. $u^3 - 3u^2 + 12$

c. $u^3 + u^2 - 9u + 12$

d. $u^3 + 7u^2 - 9u + 12$

Factor the polynomial completely.

54. $125 - t^6$

55. $2z^8 - 6z^6 - 80z^4$

56. $x^3 + 3x^2 - 4x - 12$

Find the real-number solutions of the equation.

____ 57. $p^3 - 4p^2 = 0$

a. 4, -5

b. 0, -4

c. -4, 4

d. 0, 4

58. $e^4 - 4e^2 + 3 = 0$

Divide.

____ 59. $(-11x^2 - 6x^3 + 10 + 3x) \div (3x + 1)$

a. $-2x^2 + 3x - 2 + \frac{8}{3x+1}$

b. $-2x^2 - 3x + 3 + \frac{7}{3x+1}$

c. $-2x^2 - 3x + 2 + \frac{8}{3x+1}$

d. $-2x^2 + 3x - 3 + \frac{7}{3x+1}$

Divide using synthetic division.

60. $(2x^3 + 9x^2 + 3x - 6) \div (x + 4)$

____ 61. Which is equivalent to $81^{-1/4}$?

a. 9

b. 3

c. $\frac{1}{9}$

d. $\frac{1}{3}$

Write the expression in simplest form.

62. $\sqrt[3]{54}$

Simplify:

_____ 63. $8\sqrt{5} - 2\sqrt{4} + 8\sqrt{45}$

a. $28\sqrt{5}$

b. $32\sqrt{5} - 4 + 8\sqrt{45}$

c. $32\sqrt{5} - 4$

d. $14\sqrt{54}$

Simplify:

64. $\left(\frac{w^{25}}{x^{20}}\right)^{4/5}$

65. Write $\sqrt{\frac{16xy^2}{27z^5}}$ in simplest form. Assume all variables are positive.

Simplify the expression.

66. $2^3\sqrt{128} + 3^3\sqrt{1024}$

Simplify the expression. Assume all variables are positive.

67. $\sqrt[4]{18x^8y^9z^3}$

68. $\frac{x^{3/4}y^2}{xy^{1/2}}$

69. Let $f(x) = 16 - x^2$ and $g(x) = 4 - x$. Find $f(x) - g(x)$.

70. Let $f(x) = 1 - x^2$ and $g(x) = 1 - x$. Find $f(x) \cdot g(x)$.

_____ 71. Let $g(x) = -5x^2$. Find $g(g(-1))$.

a. -5

b. 125

c. 625

d. -125

_____ 72. Let $f(x) = x^2 - 5$ and $g(x) = 3x^2$. Find $g(f(x))$.

a. $3x^4 - 30x^2 + 75$

b. $3x^4 - 15$

c. $3x^4 - 5$

d. $9x^4 - 5$

Refer to the function $g(x) = 2 + \sqrt{x+1}$.

73. What is the domain of $g(x)$?

Name: _____

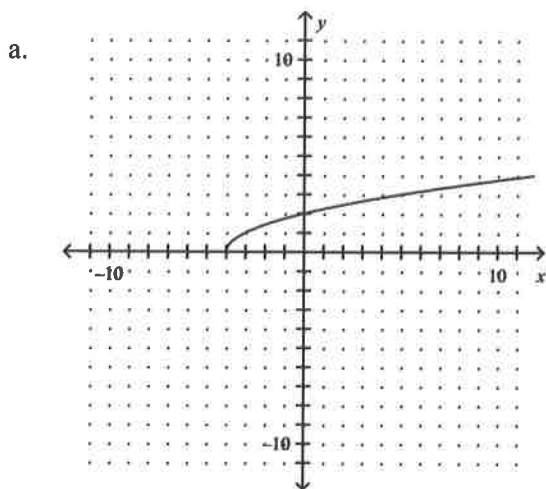
ID: A

74. What is the range of $g(x)$?

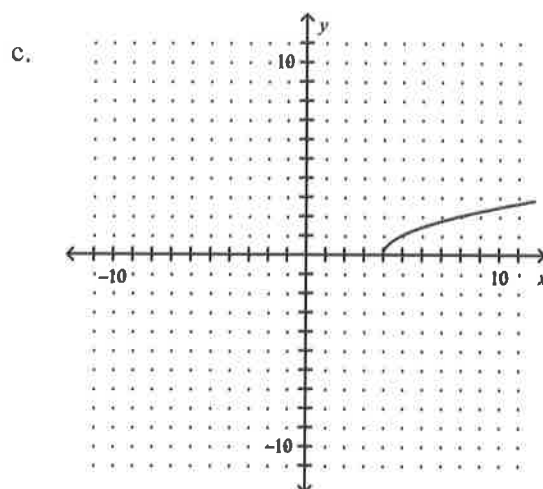
75. Sketch the graph of $g(x)$.



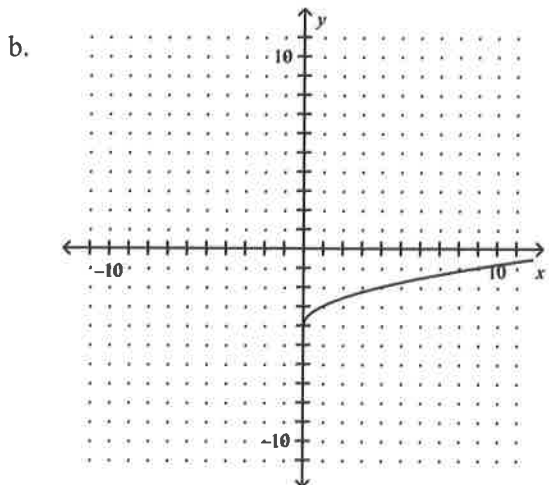
76. Which represents the graph of $y = \sqrt{x+4}$? State the domain and range of the function.



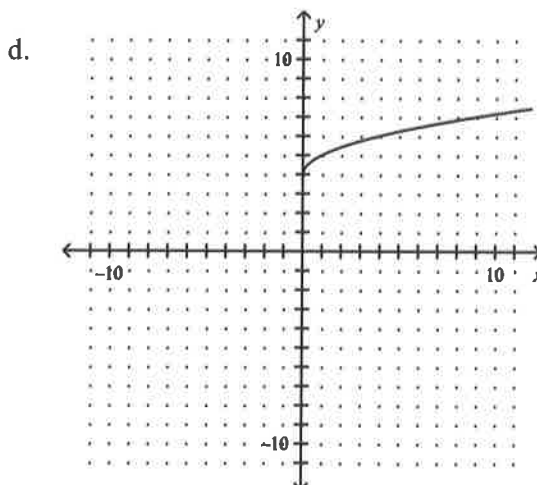
Domain: $x \geq -4$; Range: $y \geq 0$



Domain: $x \geq 4$; Range: $y \geq 0$



Domain: $x \geq 0$; Range: $y \geq -4$



Domain: $x \geq 0$; Range: $y \geq 4$

Solve the equation. Check for extraneous solutions.

77. $\sqrt{2y-7} = 11$

78. Which gives the solution(s) of $\sqrt{x+72} = x$?

a. -8

b. 9

c. no solution

d. 9, -8

Solve the equation. Check for extraneous solutions.

79. $\sqrt{x^2+5} = 3-x$

80. Which gives the solution of $\sqrt[3]{5x+4} + 5 = 6$?
- a. $-\frac{3}{5}$ c. 1
- b. $-\frac{3}{7}$ d. none of these

81. Solve $\sqrt{2x+1} = \sqrt{5-x} + 2$. Check for extraneous solutions.

Simplify the rational expression, if possible.

82. $\frac{n^2 + 2n - 24}{n^2 - 11n + 28}$
- a. $\frac{n+6}{n+7}$ b. $\frac{n+6}{n-7}$ c. $\frac{n+6}{n-4}$ d. $\frac{n-4}{n-7}$

Multiply the expressions. Simplify the result.

83. $\frac{n^2 - 9}{n+3} \cdot \frac{n}{2n-6}$
- a. $2n$ b. $\frac{1}{2n}$ c. $\frac{n+3}{n-3}$ d. $\frac{n}{2}$

Divide the expressions. Simplify the result.

84. $\frac{x^2 + 9x + 18}{x^2 - 9} \div \frac{x+6}{x-6}$
- a. $\frac{9x+6}{3}$ b. $\frac{x-6}{x-3}$ c. $\frac{x-9}{x-3}$ d. $\frac{x+3}{x-6}$

Perform the indicated operations. Simplify the result.

85. $\frac{x^2 y^3}{3x^4} \cdot \frac{(xy)^2}{x^3 y} \div \frac{x^2 y^4}{6y^3}$

86. $\frac{x+2}{x+9} \cdot \left[\frac{x^2 + 9x}{x^2 - 4} \div \frac{3x^2 + 6x}{x^2 + 2x} \right]$

Perform the indicated operation(s) and simplify.

87. $\frac{3x+4}{x^2-16} - \frac{2}{x-4}$

Name: _____

ID: A

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

Simplify the complex fraction.

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

a. $\frac{2x}{5x^2 - 27x - 18}$

c. $\frac{2x - 27}{5x}$

b. $\frac{3x}{2x + 5}$

d. $\frac{2x}{5x - 27}$

Solve the equation. Check for extraneous solutions.

90. $\frac{2x}{x - 2} = \frac{1}{x^2 - 4} + 1$