

1. Write the equation

$y = -x^2 - 6x - 10$ in the form

$y = a(x - h)^2 + k.$

[A] $y = (x+3)^2 - 1$

[B] $y = -(x+3) - 1$

[C] $y = -(x+3)^2 - 1$

[D] $y = -(x+6)^2 + 1$

2. Write a quadratic function in vertex form that has the given vertex and passes through the given point.

Vertex: $(-9, 6)$; Point: $(-7, 8)$

[A] $f(x) = \frac{1}{2}(x+9)^2 + 6$

[B] $f(x) = (x-9)^2 - 6$

[C] $f(x) = \frac{1}{2}(x+7)^2 - 8$

[D] $f(x) = 2(x-7)^2 + 8$

3. Solve by completing the square: $8x = 4x^2 - 2$

[A] $\frac{2+\sqrt{2}}{2}$ and $\frac{2-\sqrt{2}}{2}$

[B] $\frac{-2+\sqrt{2}}{2}$ and $\frac{-2-\sqrt{2}}{2}$

[C] $\frac{2+\sqrt{6}}{2}$ and $\frac{2-\sqrt{6}}{2}$

[D] $\frac{-2+\sqrt{6}}{2}$ and $\frac{-2-\sqrt{6}}{2}$

4. Solve by completing the square:

$x^2 - 4x - 5 = 0$

[A] $-1, -5$

[B] $1, -5$

[C] $1, 5$

[D] $-1, 5$

5. Solve by completing the square:

$3x^2 - 24x + 27 = 0$

[A] $x = 9$ and -1

[B] $x = 1$ and -9

[C] $x = -4 + \sqrt{7}$ and $-4 - \sqrt{7}$

[D] $x = 4 + \sqrt{7}$ and $4 - \sqrt{7}$

9. Solve the inequality algebraically:

$x^2 - 5x \geq 24$

[A] $-8 \leq x \leq 3$

[B] $x \leq -8$ or $x \geq 3$

[C] $x \leq -3$ or $x \geq 8$

[D] $-3 \leq x \leq 8$

10. Use the quadratic formula to solve:

$2x^2 - 5x - 1 = 0$

[A] $\frac{-5 + \sqrt{17}}{4}, \frac{-5 - \sqrt{17}}{4}$

[B] $\frac{5 + \sqrt{33}}{4}, \frac{5 - \sqrt{33}}{4}$

[C] $\frac{-5 + \sqrt{33}}{4}, \frac{-5 - \sqrt{33}}{4}$

[D] $\frac{5 + \sqrt{17}}{4}, \frac{5 - \sqrt{17}}{4}$

11. Solve by the quadratic formula:

$x^2 - 5x + 1 = 0$

[A] $\frac{-5 + \sqrt{21}}{2}, \frac{-5 - \sqrt{21}}{2}$

[B] $\frac{5 + \sqrt{29}}{2}, \frac{5 - \sqrt{29}}{2}$

[C] $\frac{5 + \sqrt{21}}{2}, \frac{5 - \sqrt{21}}{2}$

[D] $\frac{-5 + \sqrt{29}}{2}, \frac{-5 - \sqrt{29}}{2}$

Solve:

12. $9x^2 - 36x = -36$

[A] $x = 2$

[B] $x = \frac{1}{2}, 2$

[C] $x = -4$

[D] $x = -\frac{1}{4}, -4$

Solve:

13. $5x^2 + 3x = -4$

[A] $\frac{3+i\sqrt{89}}{10}, \frac{3-i\sqrt{89}}{10}$

[B] $\frac{3+i\sqrt{71}}{10}, \frac{3-i\sqrt{71}}{10}$

[C] $\frac{-3+i\sqrt{89}}{10}, \frac{-3-i\sqrt{89}}{10}$

[D] $\frac{-3+i\sqrt{71}}{10}, \frac{-3-i\sqrt{71}}{10}$

14. Solve by completing the square:

$-2x^2 - 16x = 14$

[A] $x = -4 + \sqrt{23}$ and $-4 - \sqrt{23}$

[B] $x = 7$ and 1

[C] $x = 4 + \sqrt{23}$ and $4 - \sqrt{23}$

[D] $x = -1$ and -7

15. Simplify the expression:

$2\sqrt{1734} \cdot \sqrt{102}$

[A] $102\sqrt{17}$

[B] $25\sqrt{6}$

[C] $204\sqrt{17}$

[D] $210\sqrt{6}$

16. Solve for x : $5x^2 = 80$

[A] 4

[B] $\sqrt{400}$

[C] $\sqrt{75}$

[D] 20

Solve:

17. $x^2 + 4x + 8 = 0$

[A] $-2 + 4i, -2 - 4i$

[B] $-2 + 2i, -2 - 2i$

[C] $2 + 2i, 2 - 2i$

[D] $2 + 4i, 2 - 4i$

18. $(6x - 2)^2 = 42$

- [A] $\frac{-2 - \sqrt{42}}{12}, \frac{-2 + \sqrt{42}}{12}$
 [B] $\frac{-2 - \sqrt{42}}{6}, \frac{-2 + \sqrt{42}}{6}$
 [C] $\frac{2 - \sqrt{42}}{12}, \frac{2 + \sqrt{42}}{12}$
 [D] $\frac{2 - \sqrt{42}}{6}, \frac{2 + \sqrt{42}}{6}$

Write the expression as a complex number in standard form.

19. $(-8 + 6i) - (5 - 3i)$

- [A] $-22 + 54i$ [B] $-13 + 9i$
 [C] $-3 + 3i$ [D] $-3 - 3i$

20. $\frac{2 - 7i}{8 - 5i}$

- [A] $\frac{1}{4} - \frac{7}{5}i$ [B] $\frac{17}{13} - \frac{46}{39}i$
 [C] $-\frac{19}{89} - \frac{66}{89}i$ [D] $\frac{51}{89} - \frac{46}{89}i$

Write the expression as a complex number in standard form.

21. $\frac{3 + 6i}{3 + 5i}$

- [A] $\frac{39}{34} + \frac{33}{34}i$ [B] $\frac{21}{16} - \frac{33}{16}i$
 [C] $\frac{21}{16} - \frac{3}{16}i$ [D] $\frac{39}{34} + \frac{3}{34}i$

22. Find the absolute value of the complex number. $8 - 7i$

- [A] 113 [B] 3.87
 [C] 10.63 [D] 15

23. Solve: $4x^2 - 10 = 6$

- [A] ± 2
 [B] ± 1
 [C] ± 4
 [D] no real-number solution

24. Factor the expression: $4y^2 - 25$

- [A] $(2y - 5)(2y - 5)$
 [B] $(4y + 1)(y - 25)$
 [C] $(2y + 5)(2y + 5)$
 [D] $(2y + 5)(2y - 5)$

25. Solve: $x^2 + 6x = 0$

- [A] 0, 6 [B] 0, -6
 [C] -6, 6 [D] -6, 5

26. What are the solutions to the equation?
 $x^2 = 3x + 54$

- [A] $x = 54$ or $x = -1$
 [B] $x = 1$ or $x = -54$
 [C] $x = 9$ or $x = -6$
 [D] $x = 6$ or $x = -9$

27. What are the solutions to the equation?
 $x^2 + x - 6 = 0$

- [A] $x = 3$ or $x = -2$
 [B] $x = 2$ or $x = -3$
 [C] $x = 1$ or $x = -6$
 [D] $x = 6$ or $x = -1$

29. Find the zeros of the equation.
 $3x^2 + 10x = 8 + y$

- [A] $x = 4$ and $x = -\frac{2}{3}$
 [B] $x = 4$ and $x = -\frac{3}{2}$
 [C] $x = -4$ and $x = \frac{3}{2}$
 [D] $x = -4$ and $x = \frac{2}{3}$

34. Use an augmented matrix to solve the system:

$$\begin{aligned} x - 2y + z &= 5 \\ 3x + y - 2z &= -26 \\ x + y - z &= -12 \end{aligned}$$

- [A] $(-1, -\frac{3}{2}, 5)$ [B] $(-5, -3, 4)$
 [C] $(-4, -3, 3)$ [D] $(-5, 3, 16)$

Evaluate the determinant of the matrix.

35. $\begin{vmatrix} 1 & 6 \\ 4 & 6 \end{vmatrix}$

- [A] 18 [B] 30
 [C] -3 [D] -18

36. $\begin{vmatrix} 5 & 2 & 4 \\ 4 & 3 & 3 \\ 1 & 1 & 5 \end{vmatrix}$

- [A] 78 [B] 30
 [C] -30 [D] -78

37. Given $A = \begin{bmatrix} -4 \\ 1 \\ -1 \end{bmatrix}$ and

$B = \begin{bmatrix} 1 & -4 & 0 \end{bmatrix}$, find AB .

[A] $[-8]$ [B] $\begin{bmatrix} -4 & 16 & 0 \\ 1 & -4 & 0 \\ -1 & 4 & 0 \end{bmatrix}$

[C] not possible [D] $\begin{bmatrix} -3 & -8 & -4 \\ 2 & -3 & 1 \\ 0 & -5 & -1 \end{bmatrix}$

38. Given $A = \begin{bmatrix} 0 & 3 & 1 \\ -1 & -1 & 0 \end{bmatrix}$ and

$B = \begin{bmatrix} 1 & -5 \\ 0 & 1 \\ 4 & -1 \end{bmatrix}$, find AB .

[A] $\begin{bmatrix} 4 & -1 \\ 2 & 4 \end{bmatrix}$ [B] $\begin{bmatrix} 4 & 2 \\ -1 & 4 \end{bmatrix}$

[C] $\begin{bmatrix} 0 & 5 \\ 0 & -1 \\ 0 & 0 \end{bmatrix}$ [D] $\begin{bmatrix} 5 & 8 & 1 \\ -1 & -1 & 0 \\ 1 & 13 & 0 \end{bmatrix}$

39. If $A = \begin{bmatrix} -8 & 5 \\ -3 & 8 \end{bmatrix}$, find $5A$.

[A] $\begin{bmatrix} -40 & -15 \\ 25 & 40 \end{bmatrix}$

[B] $\begin{bmatrix} -40 & 25 \\ -15 & 40 \end{bmatrix}$

[C] $\begin{bmatrix} 2 & 15 \\ 7 & 18 \end{bmatrix}$

[D] $\begin{bmatrix} -3 & 10 \\ 2 & 13 \end{bmatrix}$

40. Which ordered triple is a solution of the system of equations?

$$3x - 3y + 6z = -9$$

$$6x + 3y - 3z = 1$$

$$9x - 3y - 6z = -5$$

[A] $\left(\frac{2}{3}, 1, -\frac{2}{3}\right)$

[B] $\left(-\frac{2}{3}, -1, -2\right)$

[C] $\left(-\frac{2}{3}, 1, -\frac{2}{3}\right)$

[D] $\left(-\frac{2}{3}, 3, \frac{2}{3}\right)$

41. Solve the system:

$$6x + 3y + 3z = 12$$

$$3x + y - 3z = 14$$

$$x + y - 4z = 12$$

[A] the value of z is 1

[B] the value of y is 2

[C] the value of x is 3

[D] none of these

42. Solve the system of equations:

$$x + y + z = 7$$

$$-2x - y + z = -1$$

$$x - 2y - z = -4$$

[A] (2, 1, 4)

[B] (4, 1, 2)

[C] (-4, -1, -2)

[D] (-2, -1, -4)

47. Solve the linear system:

$$3x - 2y = -10$$

$$3x + y = -13$$

[A] $\left(-1, \frac{7}{2}\right)$

[B] (-3, -22)

[C] (-4, -1)

[D] no solution

49. Write the slope-intercept form of the line that passes through the point (4, -2) and has slope -4.

[A] $y = -4x + 14$

[B] $y = 4x - 14$

[C] $y = -4x - 14$

[D] $y = 4x + 14$

50. Write the standard form of the equation of the line that passes through the point (-1, 6) and is parallel to the line $8x + 5y = 1$.

[A] $-x + 6y = 1$

[B] $8x + 5y = 22$

[C] $8x - 5y = 1$

[D] $8x + 5y = 43$

51. Write the slope-intercept form of the line that passes through the point (1, 5) and is parallel to the line $y = 4x + 5$.

[A] $y = -4x - 1$

[B] $y = -4x + 19$

[C] $y = 4x - 19$

[D] $y = 4x + 1$

52. Simplify: $7(x + 1) + (x + 1)$

[A] $8x + 6$

[B] $8x + 8$

[C] $7x + 6$

[D] $7x + 8$

53. Find the x - and y -intercepts of $y = -6x - 2$.

[A] x -intercept: $-\frac{1}{3}$; y -intercept: -2

[B] x -intercept: -2; y -intercept: $-\frac{1}{3}$

[C] x -intercept: -6; y -intercept: -2

[D] x -intercept: -2; y -intercept: -6

54. Find the x - and y -intercepts of $y = 4x - 4$.

[A] x -intercept: 4; y -intercept: -4

[B] x -intercept: 1; y -intercept: -4

[C] x -intercept: -4; y -intercept: 1

[D] x -intercept: -4; y -intercept: 4

55. For the data given, find the equation of the line of best fit.

x	1	2	7	8	10
y	2	6	5	5	10

[A] $y = 0.53x + 4.42$

[B] $y = 0.541x + 4.42$

[C] $y = 0.541x + 2.65$

[D] $y = 0.53x + 2.65$

60. Find the slope of the line passing through the points (-1, 3) and (-5, 6).

[A] $-\frac{3}{2}$

[B] $\frac{8}{3}$

[C] $-\frac{3}{4}$

[D] $-\frac{4}{3}$

Solve:

61. $|x - 1| < 4$

[A] $-3 \leq x \leq 5$

[B] $x < -3$ or $x > 5$

[C] $-3 < x < 5$

[D] $x \leq -3$ or $x \geq 5$

62. $|x - 7| > 9$

[A] $-2 \leq x \leq 16$

[B] $x \leq -2$ or $x \geq 16$

[C] $-2 < x < 16$

[D] $x < -2$ or $x > 16$

Solve:

63. $|x + 2| \leq 5$

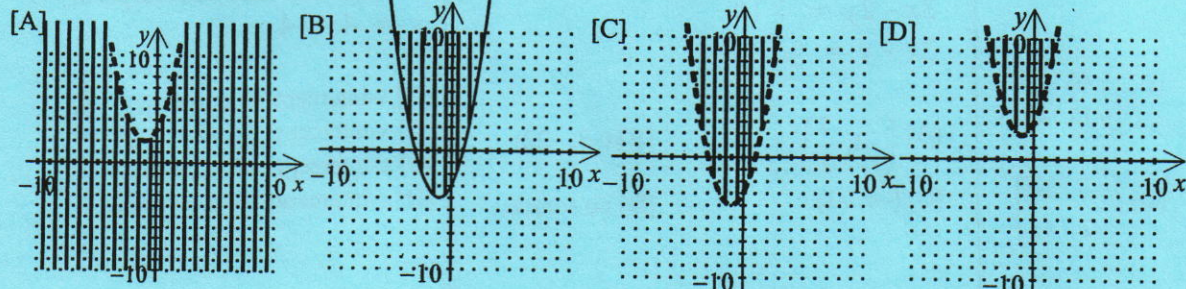
[A] $x < -7$ or $x > 3$

[B] $x \leq -7$ or $x \geq 3$

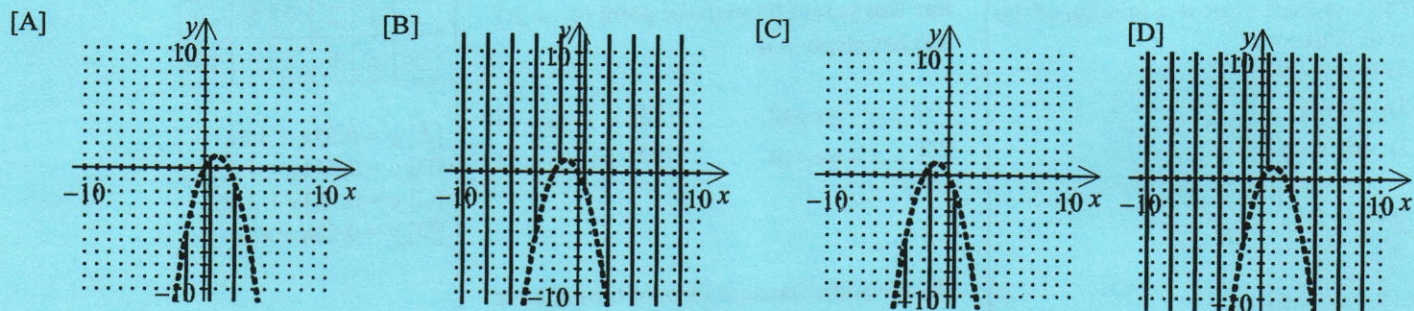
[C] $-7 < x < 3$

[D] $-7 \leq x \leq 3$

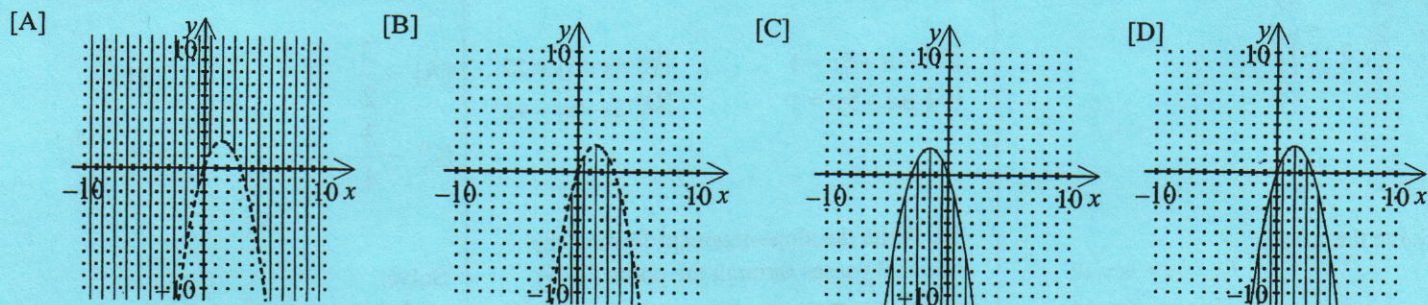
6. Graph: $y > x^2 + 2x - 3$



7. Graph: $y < -x^2 - 2x$



8. Graph: $y \leq -x^2 + 3x$



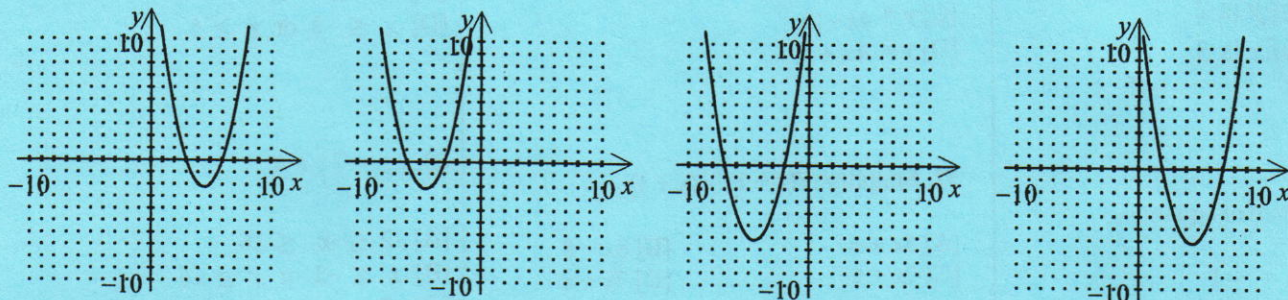
28. Find the x-intercepts of the graph of $y = x^2 - 9x + 18$.

[A] 6, 3

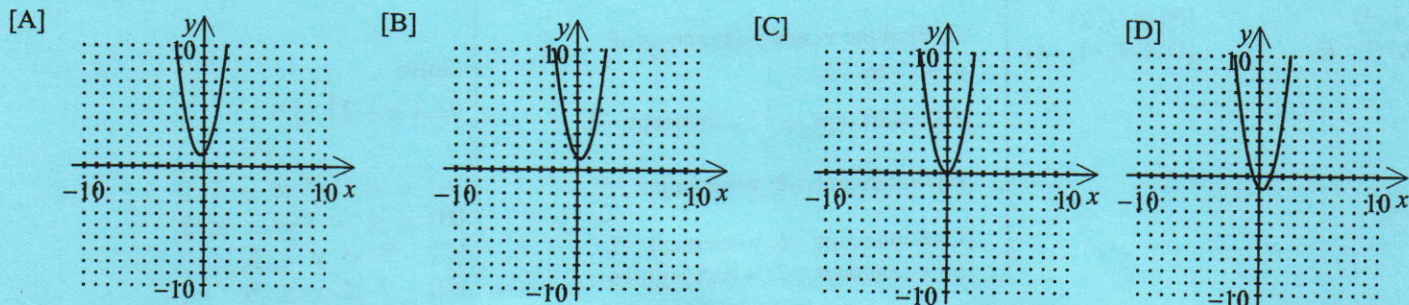
[B] -6, -3

[C] -7, -2

[D] 7, 2



30. Graph: $y = 2x^2 - x - 1$



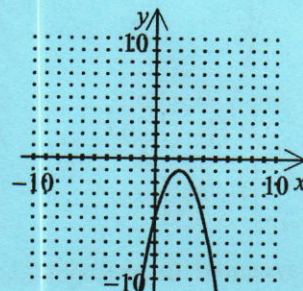
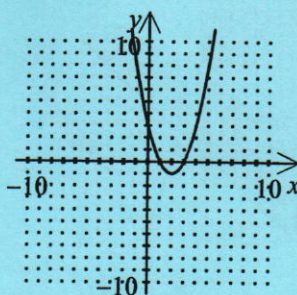
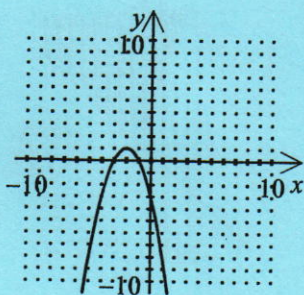
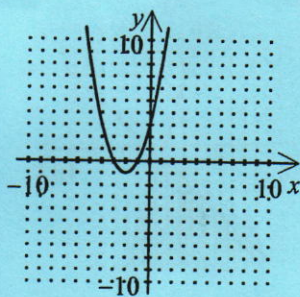
31. $y = (x-2)^2 - 1$

[A] $y = x^2 + 4x + 3$

[B] $y = -x^2 - 4x - 5$

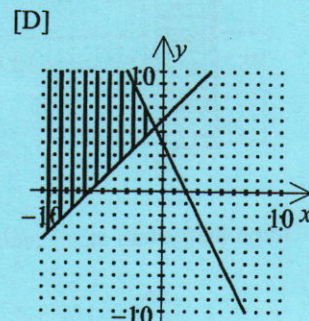
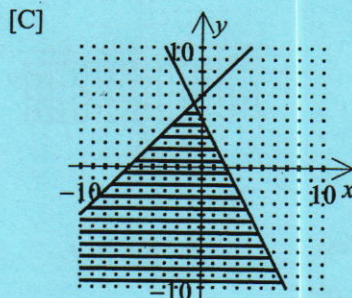
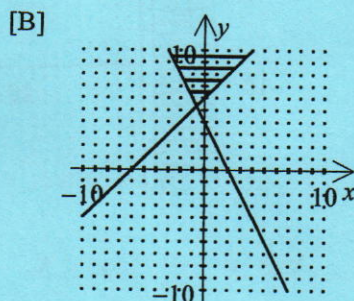
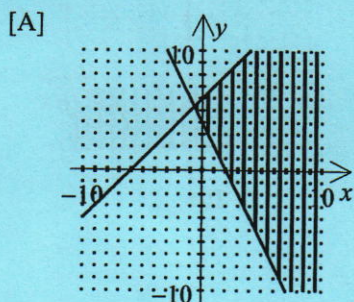
[C] $y = x^2 - 4x + 3$

[D] $y = -x^2 + 4x - 5$



43. Graph the system of inequalities: $y \leq x + 6$

$y \geq -2x + 4$



Write in standard form and graph:

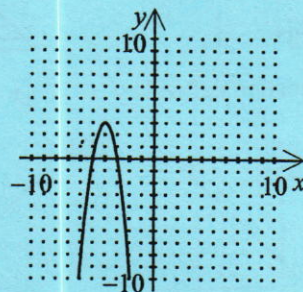
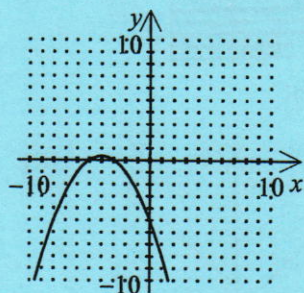
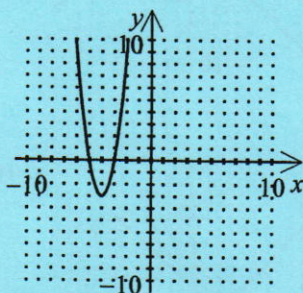
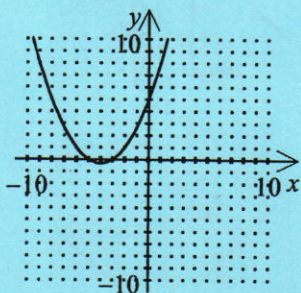
32. $y = 3(x+5)(x+3)$

[A] $y = 3x^2 - 24x - 45$

[B] $y = 3x^2 + 24x + 45$

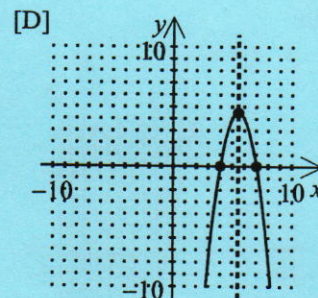
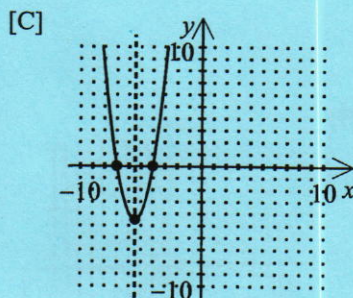
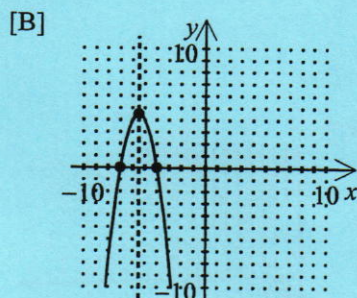
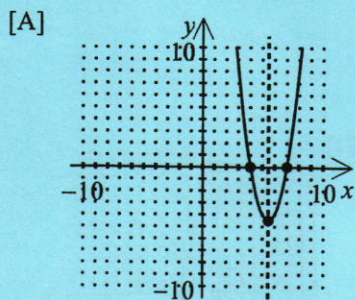
[C] $y = 45x^2 + 24x + 3$

[D] $3y = x^2 + 8x + 15$



33. Graph the function. Label the vertex, axis of symmetry, and x-intercepts.

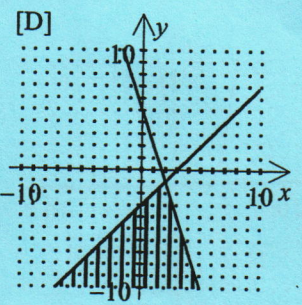
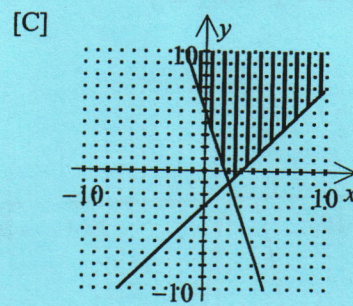
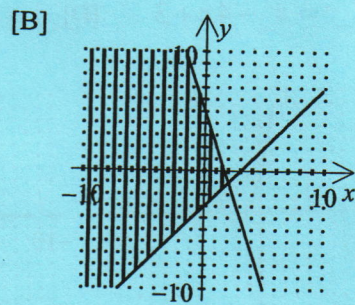
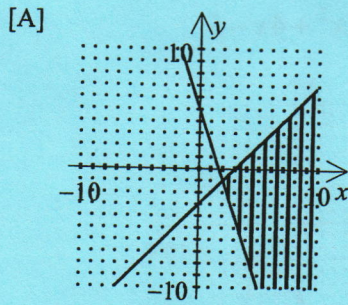
$y = -2(x+7)(x+4)$



44. Determine the solution to the system of inequalities:

$$y \geq x - 3$$

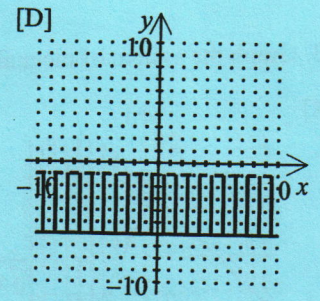
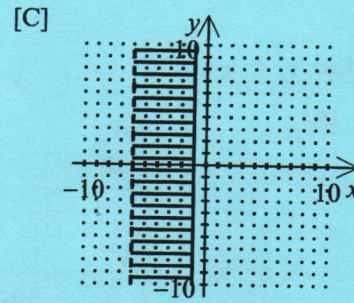
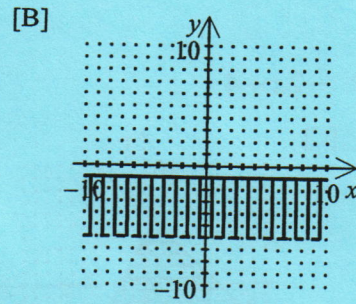
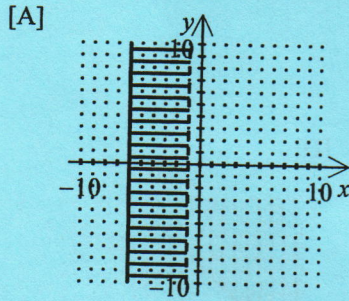
$$3x + y \leq 5$$



45. Graph the system of linear inequalities:

$$x \geq -6$$

$$x < -1$$

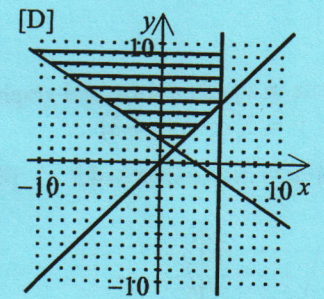
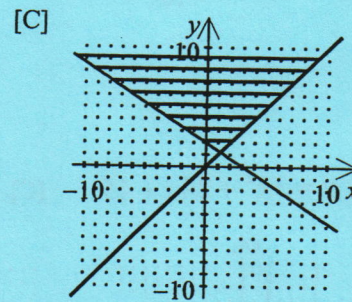
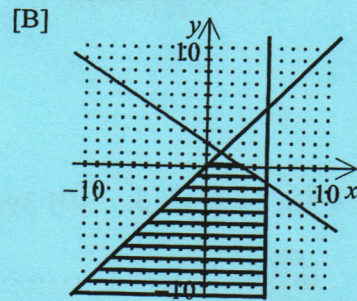
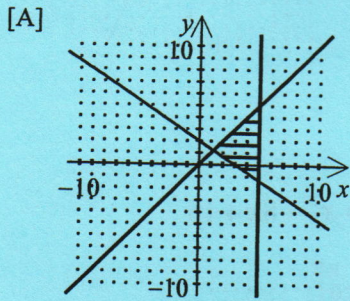


46. Graph the system of inequalities:

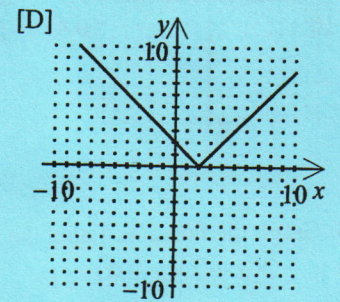
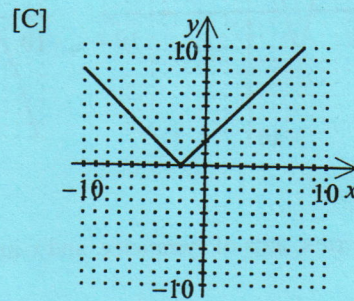
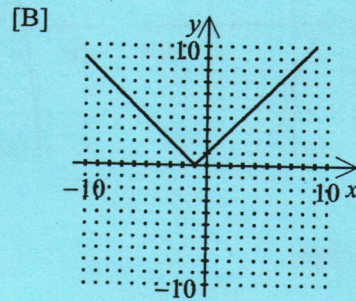
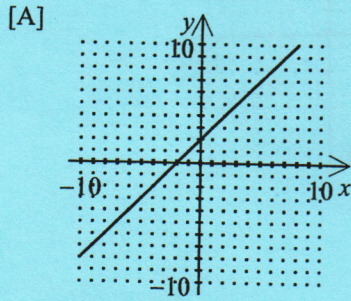
$$2x + 3y \geq 6$$

$$x \geq y$$

$$x \leq 5$$

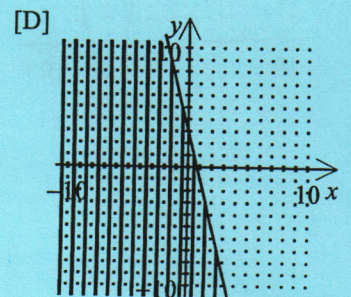
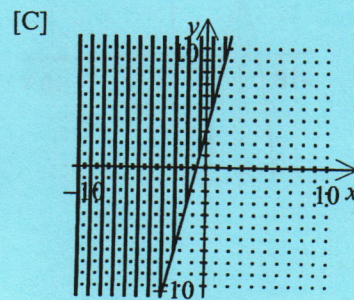
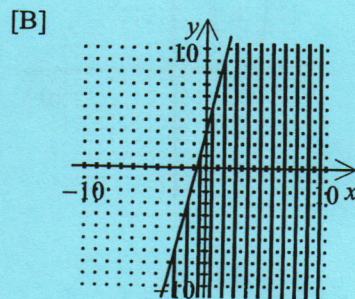
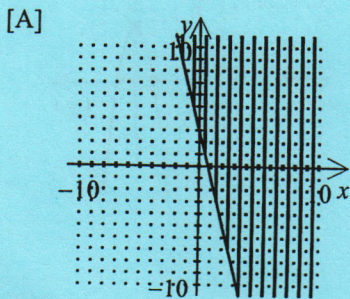


48. Graph the function defined by $y = |x + 2|$.



Graph:

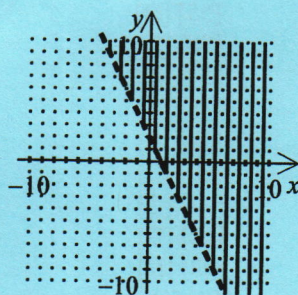
56. $-y \geq 4x - 3$



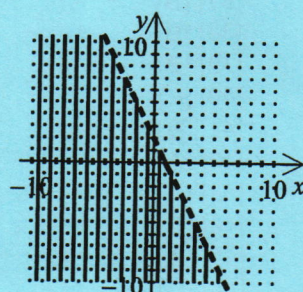
Graph:

57. $2x - y > -2$

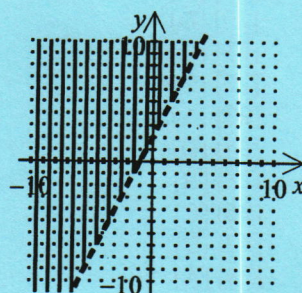
[A]



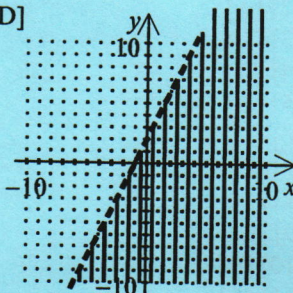
[B]



[C]



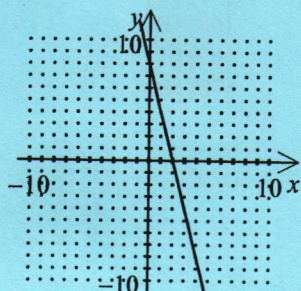
[D]



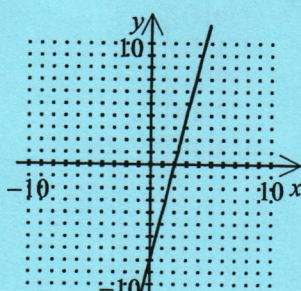
Graph:

58. $4x - y = 8$

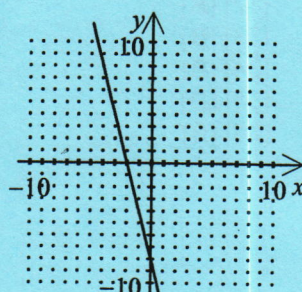
[A]



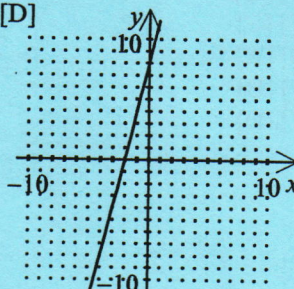
[B]



[C]



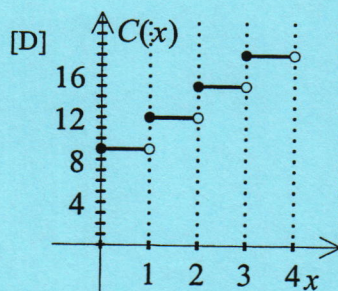
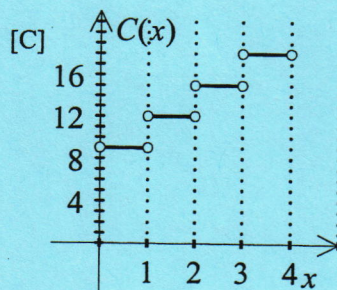
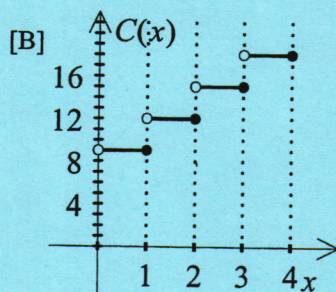
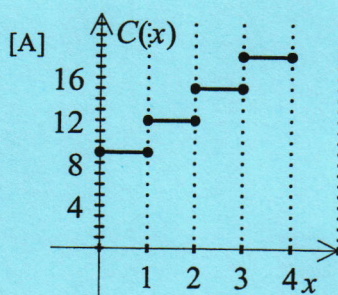
[D]



59. Express Package Delivery Service uses the weight of a package to determine the charge for delivery. The charge is \$9 for the first pound (or any fraction thereof) and \$3 for each additional pound (or fraction thereof) up to 9 pounds. If $C(x)$ is the charge for delivering a package weighing x pounds, then

$$C(x) = \begin{cases} 9 & \text{for } 0 < x \leq 1 \\ 12 & \text{for } 1 < x \leq 2 \\ 15 & \text{for } 2 < x \leq 3 \end{cases}$$

and so on. Graph C for $0 < x \leq 4$.



[1] [C]
[2] [A]
[3] [C]
[4] [D]
[5] [D]
[6] [C]
[7] [C]
[8] [D]
[9] [C]
[10] [B]
[11] [C]
[12] [A]
[13] [D]
[14] [D]
[15] [C]
[16] [A]
[17] [B]
[18] [D]

[19] [B]
[20] [D]
[21] [D]
[22] [C]
[23] [A]
[24] [D]
[25] [B]
[26] [C]
[27] [B]
[28] [A]
[29] [D]
[30] [D]
[31] [C]
[32] [B]
[33] [B]
[34] [B]
[35] [D]
[36] [B]

[37] [B]
[38] [B]
[39] [B]
[40] [C]
[41] [B]
[42] [A]
[43] [A]
[44] [B]
[45] [A]
[46] [D]
[47] [C]
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[54] [B]

[55] [D]
[56] [D]
[57] [D]
[58] [B]
[59] [B]
[60] [C]
[61] [C]
[62] [D]
[63] [D]
[64] [C]
[65] [D]
[66] [A]
[67] [B]
[68] [D]
[69] [C]
[70] [B]