

Key

Algebra II Midterm Exam Review (Sections 1.1 - 4.3)

- A** 1 Evaluate $5t + 6u$ for $t = -3$ and $u = 2$.
- (A) -3
 - (B) -1
 - (C) 27
 - (D) 11

$5(-3) + 6(2)$
 $-15 + 12$
 -3

Simplify the expression.

- D** 2 $10(a - 3) - 2(a - 3)$
- (A) $12a - 36$
 - (B) $12a + 36$
 - (C) $8a + 24$
 - (D) $8a - 24$

$10a - 30 - 2a + 6$
 $8a - 24$

Determine which value is the solution of the equation.

- A** 3 $10 - 5x = -10$
- (A) 4
 - (B) -20
 - (C) -15
 - (D) 0

$-5x = -20$
 $\frac{-5x}{-5} = \frac{-20}{-5}$
 $x = 4$

- A** 4 $\frac{x}{3} + \frac{x}{5} = 16$
- (A) 30
 - (B) $\frac{10}{3}$
 - (C) 64
 - (D) 5

Need a common denominator
 $\frac{5x}{15} + \frac{3x}{15} = 16 \rightarrow 8x = 240$
 $15(\frac{8x}{15}) = (16)15 \rightarrow x = 30$

- C** 5 The literature club is printing a storybook to raise money. The print shop charges \$5 for each book, and \$80 to create the film. How many books can the club print if their budget is \$1155?
- (A) 246
 - (B) 200
 - (C) 215
 - (D) 231

$5x + 80 = 1155$
 $5x = 1075$
 $x = 215$

- C** 6 Solve for t in the equation $10 = 3t + s$.
- (A) $t = 7 - s$
 - (B) $t = \frac{s + 10}{3}$
 - (C) $t = \frac{10 - s}{3}$
 - (D) $t = \frac{10s}{3}$

$10 = 3t + s$
 $10 - s = 3t$
 $\frac{10 - s}{3} = \frac{3t}{3}$

Solve.

- D** 7 $10r - 14 \leq 8r + 2$
- (A) $r \leq -8$
 - (B) $r = 16$
 - (C) $r \geq 16$
 - (D) $r \leq 8$

$10r - 14 \leq 8r + 2$
 $2r \leq 16$
 $r \leq 8$

Solve the absolute value equation.

- A** 8 $|3c + 2| = 3$
- (A) $\frac{1}{3}, -\frac{5}{3}$
 - (B) 1, 2
 - (C) $\frac{1}{3}, \frac{5}{3}$
 - (D) 1, -1

$|3c + 2| = 3$
 $3c + 2 = 3$ $3c + 2 = -3$
 $3c = 1$ $3c = -5$
 $c = \frac{1}{3}$ $c = -\frac{5}{3}$

Solve the absolute value inequality.

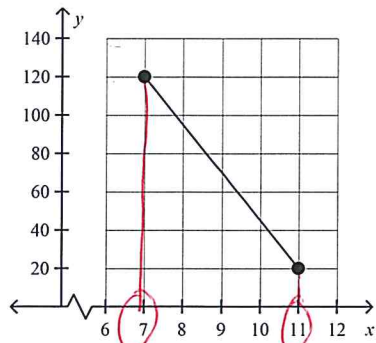
- D** 9 $|g - 5| > 2$
- (A) $g \leq 3$ or $g \geq 7$
 - (B) $3 < g < 7$
 - (C) $3 \leq g \leq 7$
 - (D) $g < 3$ or $g > 7$

$|g - 5| > 2$
 $g - 5 > 2$ or $g - 5 < -2$
 $g > 7$ or $g < 3$

- D** 10 $|z + 7| \leq 6$
- (A) $z \leq -13$ or $z \geq -1$
 - (B) $-13 < z < -1$
 - (C) $z < -13$ or $z > -1$
 - (D) $-13 \leq z \leq -1$

$|z + 7| \leq 6$
 $z + 7 \leq 6$ AND $z + 7 \geq -6$
 $z \leq -1$ AND $z \geq -13$
 $-13 \leq z \leq -1$

11 What is the domain of the function in the graph?



- (A) $20 \leq x \leq 120$
- (B) $7 \leq y \leq 11$
- (C) $7 \leq x \leq 11$
- (D) $20 \leq y \leq 120$

$7 \leq x \leq 11$

12 Find the slope of the line passing through the points $(-8, 5)$ and $(4, 6)$.

- (A) $\frac{1}{12}$
- (B) $-\frac{11}{4}$
- (C) 12
- (D) $-\frac{4}{11}$

$m = \frac{y_2 - y_1}{x_2 - x_1}$
 $\frac{6 - 5}{4 - (-8)} = \frac{1}{12}$

13 Find the x- and y-intercepts of $y = 8x - 8$.

- (A) x-intercept: 8; y-intercept: -8
- (B) x-intercept: -8; y-intercept: 1
- (C) x-intercept: -8; y-intercept: 8
- (D) x-intercept: 1; y-intercept: -8

$y = mx + b$
 $0 = 8x - 8$
 $8 = 8x$
 $1 = x$

14 Which equation represents a line that passes through the point $(1, -2)$ and has slope 2?

- (A) $y = 2x + 4$
- (B) $y = 2x - 4$
- (C) $y = -2x - 4$
- (D) $y = -2x + 4$

$y - y_1 = m(x - x_1)$
 $y + 2 = 2(x - 1)$
 $y + 2 = 2x - 2$
 $y = 2x - 4$

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

- 15 $y = -2x + 5; (0, 4)$
- (A) $y = 2x - 4$
 - (B) $y = -2x + 4$
 - (C) $y = \frac{1}{2}x + 4$
 - (D) $y = -2x + 8$

parallel = same slope
 $y = -2x + 4$

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

- 16 $y = 2x + 2; (2, -4)$
- (A) $y = -\frac{1}{2}x - 3$
 - (B) $y = \frac{1}{2}x - 3$
 - (C) $y = -\frac{1}{2}x + 3$
 - (D) $y = \frac{1}{2}x + 3$

perpendicular = opp reciprocal slopes
 $y + 4 = -\frac{1}{2}(x - 2)$
 $y + 4 = -\frac{1}{2}x + 1$
 $y = -\frac{1}{2}x - 3$

17 Write the standard form of the equation of the line that has slope 2 and passes through the point $(5, -4)$.

- (A) $x - 2y = -13$
- (B) $-2x - y = -14$
- (C) $2x - y = 14$
- (D) $-x + 2y = 13$

$y + 4 = 2(x - 5)$
 $y + 4 = 2x - 10$
 $y = 2x - 14$
 $-2x + y = -14 \rightarrow 2x - y = 14$

18 Which of the following best describes the graphs of the equations below?

$2y = 7x + 10$
 $6y = 21x + 20$

- (A) The lines are parallel.
- (B) The lines are perpendicular.
- (C) The lines have the same y-intercept.
- (D) The lines have the same x-intercept.

$-3(2y = 7x + 10)$
 $-6y = -21x - 30$
 $6y = 21x + 20$
 $0 = 0 - 10$
 parallel

Solve the linear system.

- 19 $-x - y = -2$
 $2x + 4y = 10$
 (A) (4, 1)
 (B) (-1, 3)
 (C) (1, 3)
 (D) no solution

$2(-x - y = -2)$
 $-2x - 2y = -4$
 $2x + 4y = 10$
 $0 + 2y = 6$
 $y = 3$

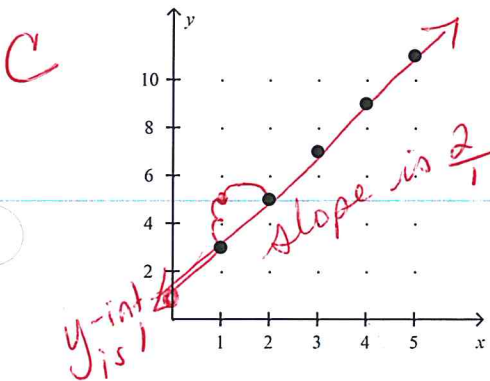
$-x - 3 = -2$
 $-x = 1$
 $x = -1$

- 20 $-4x + y = -16$
 $-2x - y = -14$
 (A) (6, -6)
 (B) (3, 6)
 (C) (5, 4)
 (D) no solution

$-4x + y = -16$
 $-2x - y = -14$
 $-6x = -30$
 $x = 5$

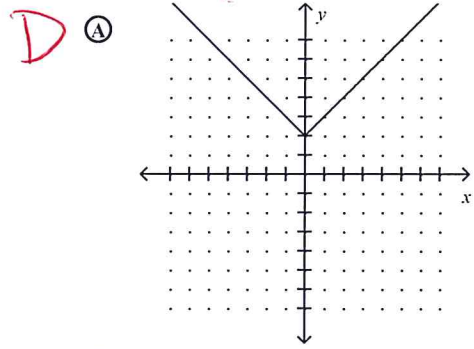
$-4(5) + y = -16$
 $-20 + y = -16$
 $y = 4$

21 Which equation represents the scatter plot?

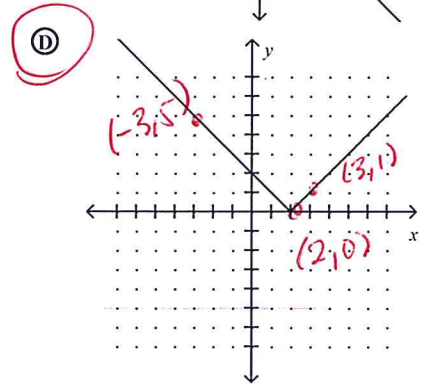
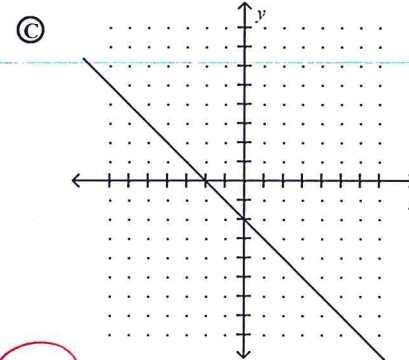
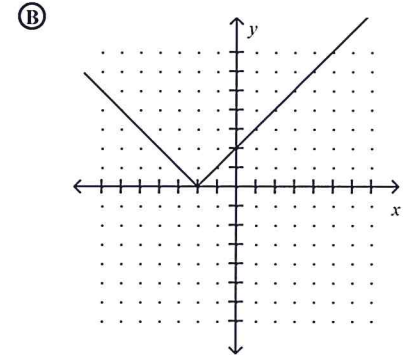


- (A) $y = 2 - 2x$
 (B) $y = 2x - 1$
 (C) $y = 2x + 1$
 (D) $y = 1 - 2x$

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



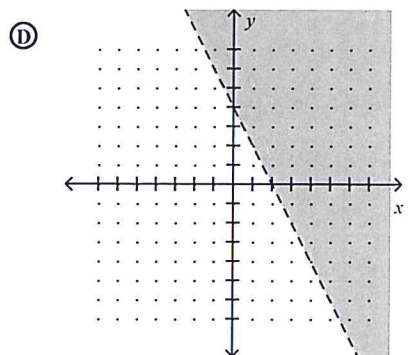
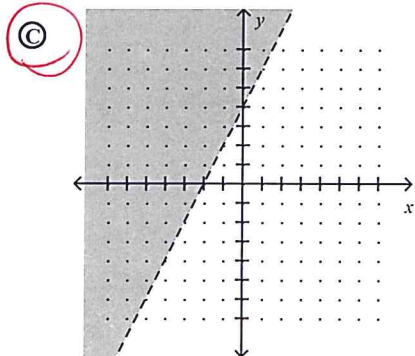
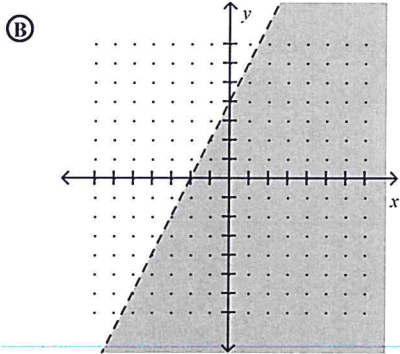
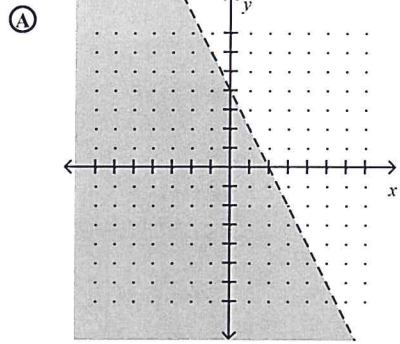
| x | y |
|----|---|
| -3 | 5 |
| -2 | 4 |
| -1 | 3 |
| 0 | 2 |
| 1 | 1 |
| 2 | 0 |
| 3 | 1 |



Graph the inequality in a coordinate plane.

23 $4x - 2y < -8$

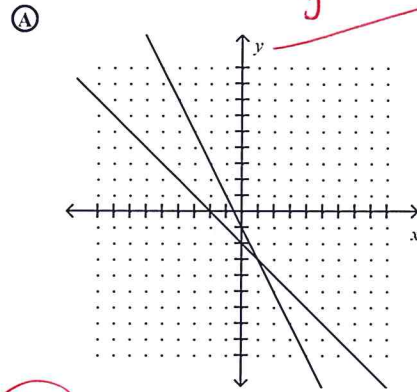
$4x - 2y < -8$
 $-2y < -4x - 8$
 $\frac{-2y}{-2} < \frac{-4x - 8}{-2}$
 $y > 2x + 4$



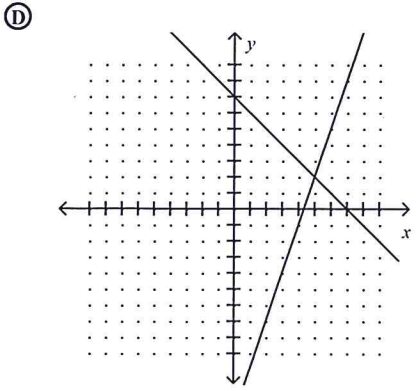
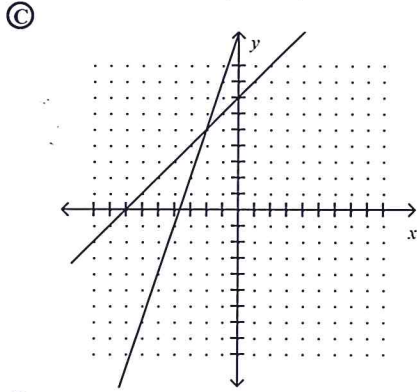
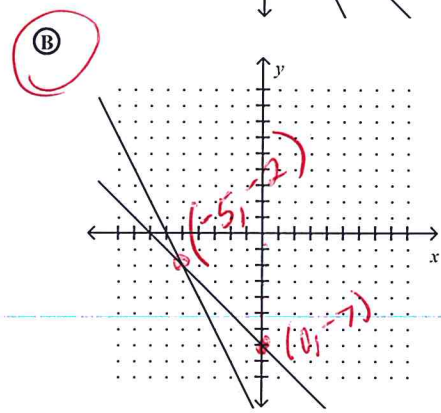
Graph the linear system.

24 $x + y = -7$
 $2x + y = -12$

$y = -x - 7$
 $y = -2x - 12$



$-x - 7 = -2x - 12$
 $x = -5$
 $y = 5 - 7$
 $y = -2$

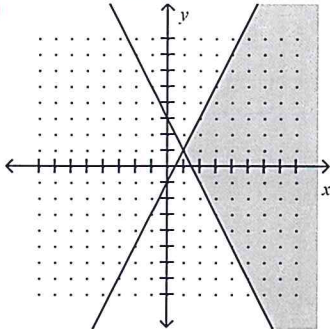


Graph the system of inequalities.

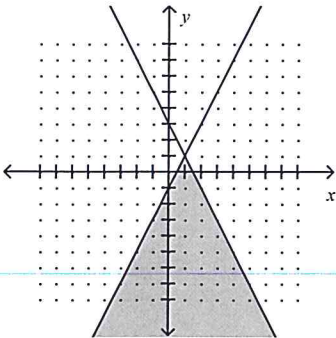
25 $y \leq 2x - 1$
 $y \geq -2x + 3$

A

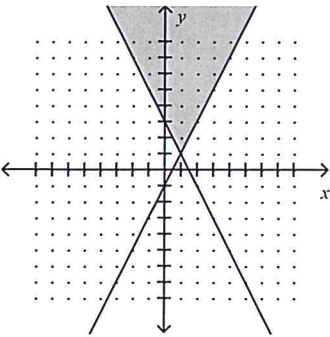
(A)



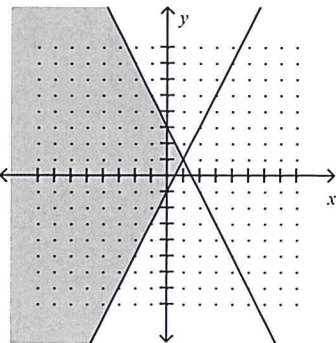
(B)



(C)



(D)

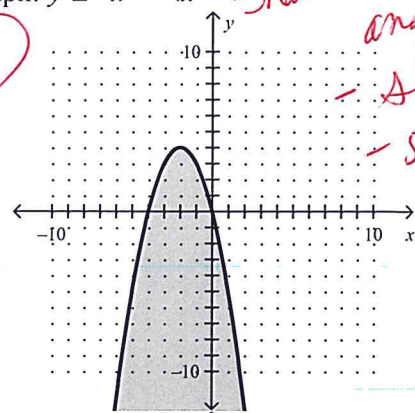


A Graph.

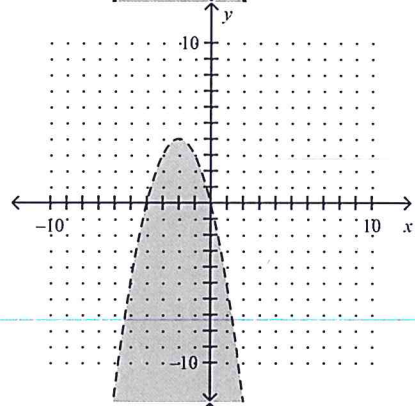
26 Graph: $y \leq -x^2 - 4x$

$y \leq -x(x+4)$
 - has x-int at (0,0) and (-4,0)
 - shades down
 - solid line

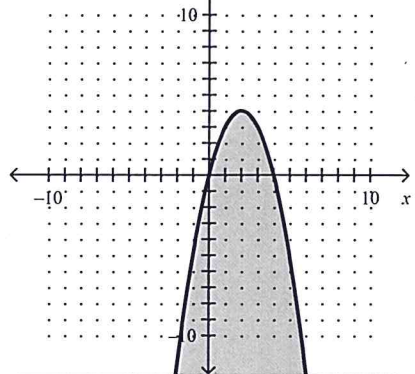
(A)



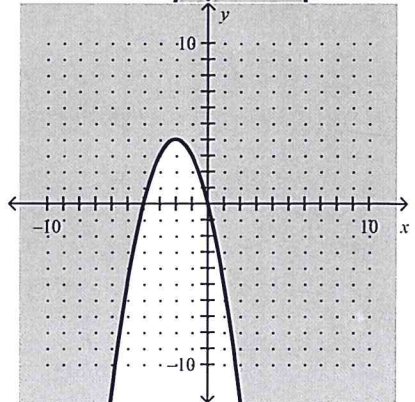
(B)



(C)



(D)



Find the sum of the matrices.

D 27 $\begin{bmatrix} -12 & 43 \\ -12 & 12 \end{bmatrix} + \begin{bmatrix} -26 & 23 \\ -44 & -20 \end{bmatrix} = \begin{bmatrix} -38 & 66 \\ -56 & -8 \end{bmatrix}$

(A) $\begin{bmatrix} 14 & 20 \\ 32 & 32 \end{bmatrix}$

(B) $\begin{bmatrix} 14 & 20 \\ -56 & -8 \end{bmatrix}$

(C) $\begin{bmatrix} -38 & 66 \\ 32 & 32 \end{bmatrix}$

(D) $\begin{bmatrix} -38 & 66 \\ -56 & -8 \end{bmatrix}$

C 28 If $A = \begin{bmatrix} 4 & 5 \\ 1 & -9 \end{bmatrix}$, find $-5A$. $\begin{bmatrix} -20 & -25 \\ -5 & 45 \end{bmatrix}$

(A) $\begin{bmatrix} -20 & 5 \\ -5 & -9 \end{bmatrix}$

(B) $\begin{bmatrix} -1 & 0 \\ -4 & -14 \end{bmatrix}$

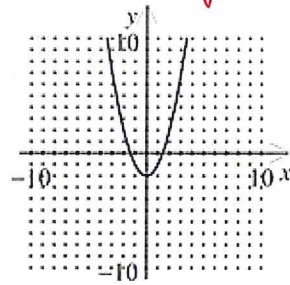
(C) $\begin{bmatrix} -20 & -25 \\ -5 & 45 \end{bmatrix}$

(D) $\begin{bmatrix} -20 & -25 \\ 1 & -9 \end{bmatrix}$

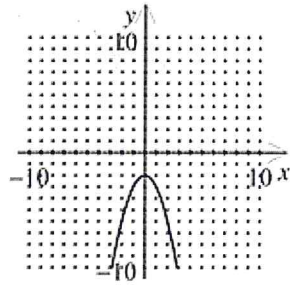
Graph.

B 29 $y = -x^2 - 2$ opens down vertex (0, -2)

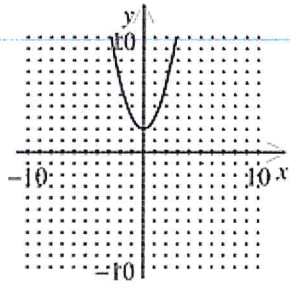
(A)



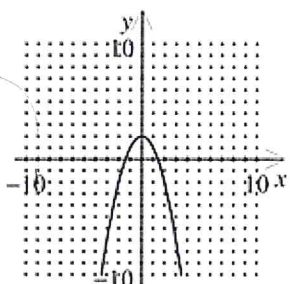
(B)



(C)



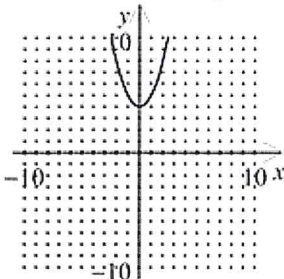
(D)



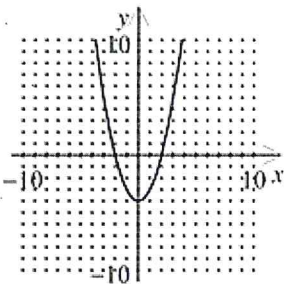
30 $y = -x^2 + 4$

*opens down
vertex (0,4)*

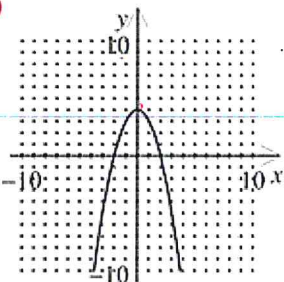
(A)



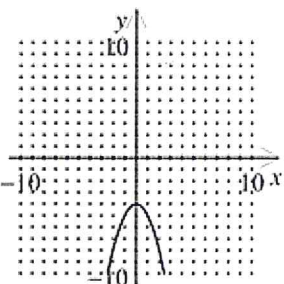
(B)



(C)



(D)



~~-12×10~~
 ~~-2~~

| | | |
|--------|--------|------|
| $8u^2$ | $-12u$ | $4u$ |
| $10u$ | -15 | 5 |

Factor completely $2u-3$

- A 31 $24u^6 - 6u^5 - 45u^4$ $3u^4(8u^2 - 2u - 15)$
 (A) $3u^4(2u-3)(4u+5)$ $3u^4(2u-3)(4u+5)$
 (B) $u^4(4u+3)(2u+5)$
 (C) $3u^4(4u-3)(2u+5)$
 (D) $u^4(2u-3)(4u+5)$

Factor the expression.

- A 32 $25x^2 - 9$ *difference of squares*
 (A) $(5x+3)(5x-3)$ $(5x+3)(5x-3)$
 (B) $(5x-3)(5x-3)$
 (C) $(25x-1)(x+9)$
 (D) $(25x+1)(x-9)$

- C 33 $8x^2 - 14x - 6$
 (A) $(4x-6)(2x-1)$
 (B) $(8x-6)(x-1)$
 (C) Does not factor
 (D) $(8x-1)(x-6)$

$2(4x^2 - 7x - 3)$

| | |
|--------|------|
| $4x^2$ | |
| | -3 |

 ~~-12~~
 ~~-7~~

- A 34 How would you translate the graph of $y = -x^2$ to produce the graph of $y = -(x+3)^2$?
 (A) translate the graph of $y = -x^2$ left 3 units
 (B) translate the graph of $y = -x^2$ up 3 units
 (C) translate the graph of $y = -x^2$ right 3 units
 (D) translate the graph of $y = -x^2$ down 3 units

- D 35 Write as the product of two factors: $x^2 - 11x - 42$
 (A) $(x-3)(x+14)$
 (B) $(x-3)(x-14)$
 (C) $(x+3)(x+14)$
 (D) $(x+3)(x-14)$
 $(x-14)(x+3)$

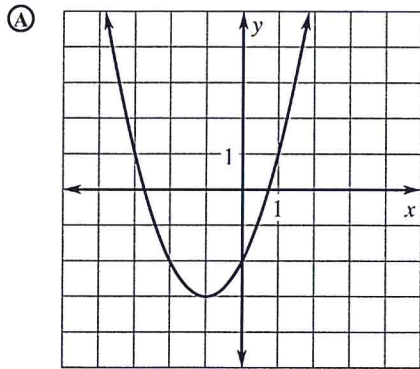
- D 36 Tickets to a local movie were sold at \$6.00 for adults and \$4.50 for students. If 240 tickets were sold for a total of \$1230.00, how many student tickets were sold?
 (A) 100
 (B) 40
 (C) 115
 (D) 140

$x = \text{adults}$
 $y = \text{students}$
 $6x + 4.5y = 1230$
 $(x + y = 240) \times 4$
 $-6x - 4y = -960$

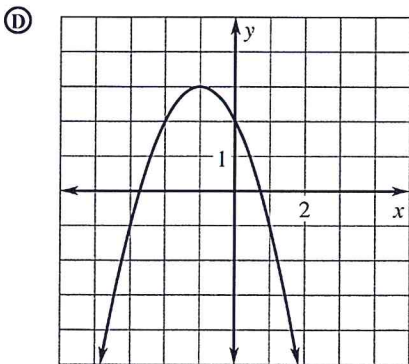
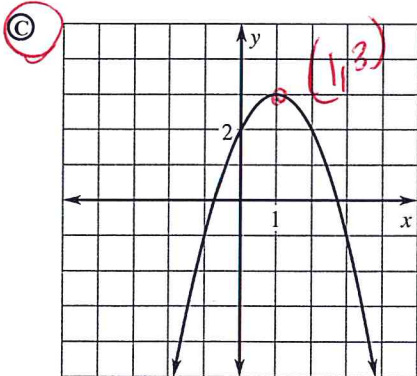
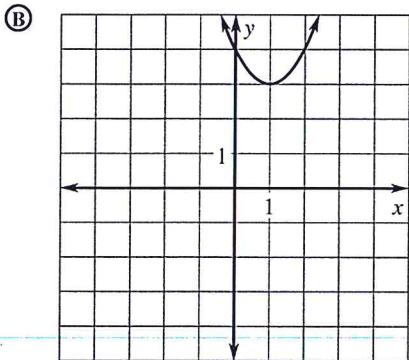
 $-1.5y = 270$
 $y = 140$

37 Graph the parabola: $y = -(x - 1)^2 + 3$

C



Opens down
- right 1
- up 3
Vertex at (1, 3)

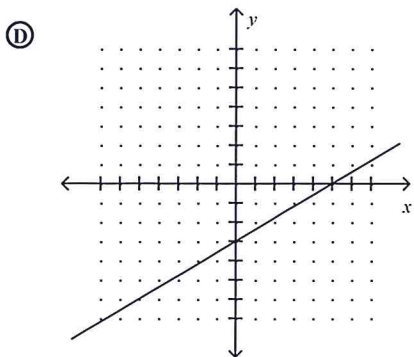
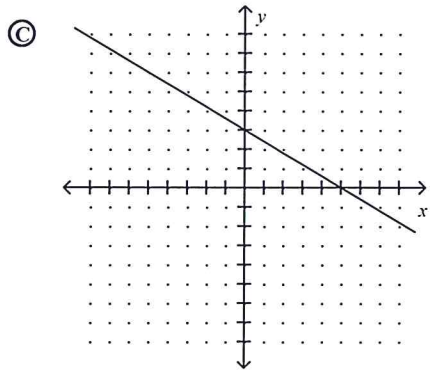
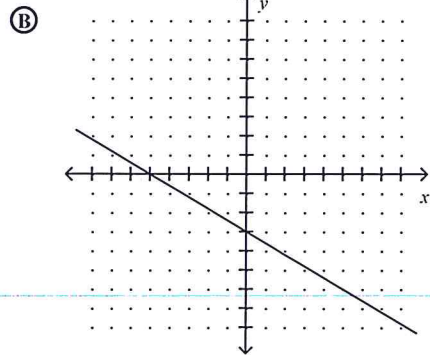
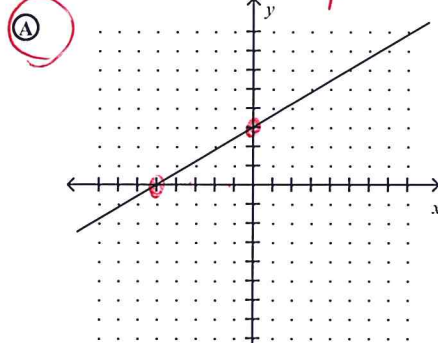


Graph the equation.

X-int (-5, 0)
Y-int (0, 3)

38 $3x - 5y = -15$

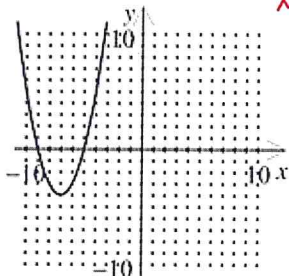
A



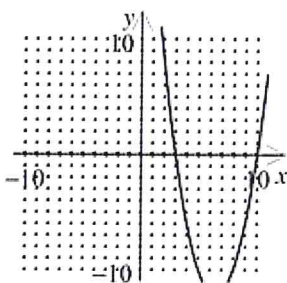
39 Find the x -intercepts of the graph of $y = x^2 - 14x + 45$.

(A) -9, -5

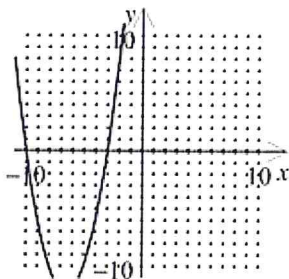
$y = (x-9)(x-5)$
 $\downarrow \quad \downarrow$
 $x=9 \quad x=5$



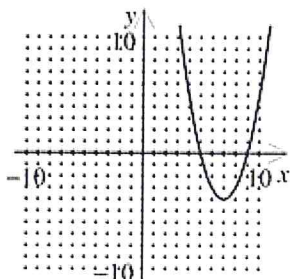
(B) 10, 3



(C) -10, -3

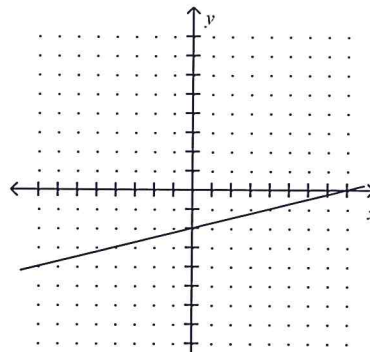


(D) 9, 5

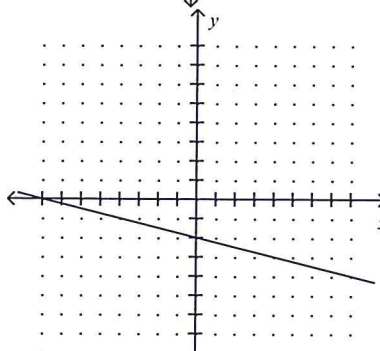


40 Graph $f(x) = \frac{1}{4}x + 2$.

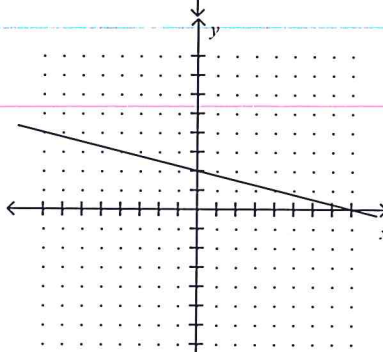
(A)



(B)



(C)



(D)

