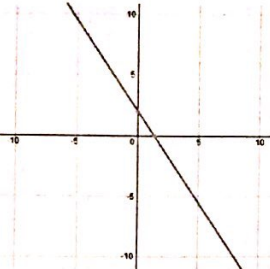
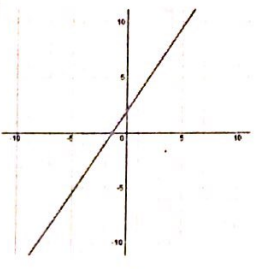
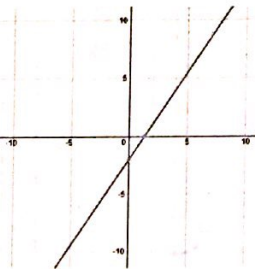
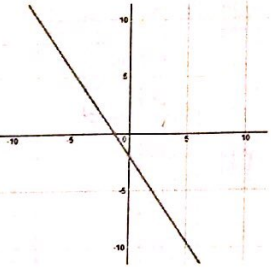


- B 1. Which of the following equations is a line passing through points $(-4, -1)$ and $(0, 7)$?
 (A) $y = 2x + 9$ (B) $y = 2x + 7$ (C) $y = \frac{1}{2}x + 7$ (D) $y = -\frac{1}{2}x + 7$

- A 2. Which of the following is a graph of $3x + 2y = 4$?
 (A)  (B)  (C)  (D) 

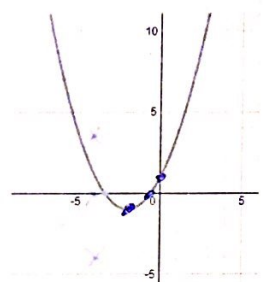
- D 3. Choose the equation that represents a parabola with the following characteristics:
 Opens down AND Has a vertex of $(-1, -5)$
 (A) $y = (x - 1)^2 - 5$ (B) $y = (x + 1)^2 - 5$ (C) $y = -(x - 1)^2 - 5$ (D) $y = -(x + 1)^2 - 5$

Handwritten notes:
 ↙ down 5
 ↕ open down
 ↖ left 1

- C 4. Find all zeros: $f(x) = x^3 - 2x^2 + x - 2$.
 (A) $x = 2$ (B) $x = i, \pm 2$ (C) $x = \pm i, 2$ (D) $x = \pm 1, 2$

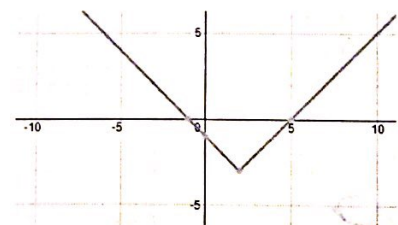
- A 5. Solve the equation: $x^4 - 5x^2 + 4 = 0$.
 (A) $x = \pm 1, \pm 2$ (B) $x = \pm i, \pm 2$ (C) $x = \pm 1, \pm 2i$ (D) $x = \pm i, \pm 2i$

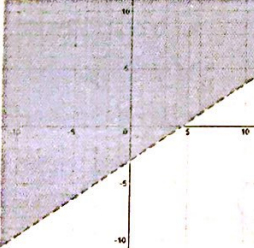
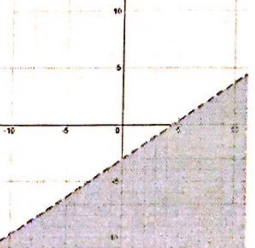
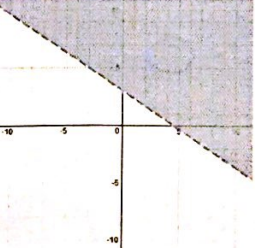
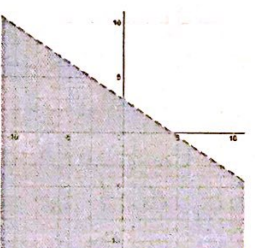
- C 6. Which equation is graphed at right?
 (A) $y = 2(x + 2)^2 - 1$
 (B) $y = 2(x - 2)^2 - 1$
 (C) $y = \frac{1}{2}(x + 2)^2 - 1$
 (D) $y = \frac{1}{2}(x - 2)^2 - 1$



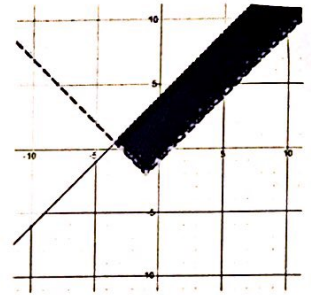
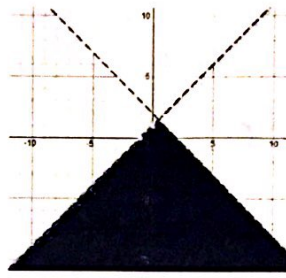
- C 7. Identify the vertex and y-intercept of the graph of the function $y = 3x^2 - 12x + 13$.
 (A) Vertex: $(2, 1)$, y-intercept: -13 (B) Vertex: $(-2, 49)$, y-intercept: -13
 (C) Vertex: $(2, 1)$, y-intercept: 13 (D) Vertex: $(-2, 49)$, y-intercept: 13

- A 8. Which equation is graphed at right?
 (A) $y = |x - 2| - 3$ (B) $y = |x - 2| + 3$
 (C) $y = |x + 2| - 3$ (D) $y = |x + 2| + 3$



- D 9. Which of the following graphs represents the inequality $2x + 3y < 9$?
 (A)  (B)  (C)  (D) 

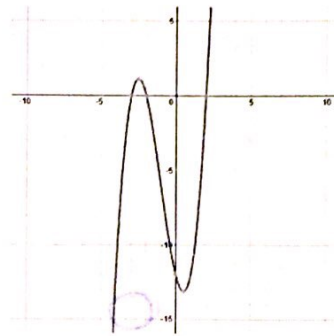
- D 10. Which system of equations is graphed?
 (A) $y < -x + 2$
 $y > x + 1$
 (B) $y > -x + 2$
 $y > x + 1$
 (C) $y > -x + 2$
 $y < x + 1$
 (D) $y < -x + 2$
 $y < x + 1$



- C 11. Which system of inequalities is graphed at right?
 (A) $y > |x + 1| - 2$ $y \geq x + 4$ (B) $y < |x + 1| - 2$ $y \geq x + 4$
 (C) $y > |x + 1| - 2$ $y \leq x + 4$ (D) $y < |x + 1| - 2$ $y \leq x + 4$

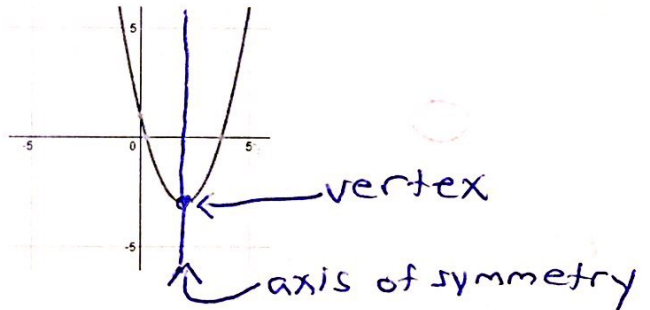
- B 12. What is the correct list of possible rational zeros for $f(x) = 3x^3 - 2x^2 + 2$?
 (A) $\pm 1, \pm 3, \pm \frac{1}{2}, \pm \frac{3}{2}$ (B) $\pm 1, \pm 3, \pm \frac{1}{3}, \pm \frac{2}{3}$ (C) $\pm 1, \pm 2, \pm \frac{1}{3}, \pm \frac{2}{3}$ (D) $\pm 1, \pm 2, \pm \frac{1}{2}, \pm \frac{3}{2}$

- B 13. Find all real zeros of the graph of $y = x^3 + 3x^2 - 4x - 12$.
 (A) -2, 2, 3
 (B) -3, -2, 2
 (C) -12, -2, 2, 3
 (D) -12, -3, -2, 2



- B 14. Which of the following is a factor of $x^2 + 8x + 16$?
 (A) $(x - 4)$ (B) $(x + 4)$ (C) $(x + 8)$ (D) $(x + 16)$

- C 15. What is the vertex and axis of symmetry of the graph?
 (A) vertex: (-3, 2) axis of symmetry: $x = 2$
 (B) vertex: (-3, 2) axis of symmetry: $x = -3$
 (C) vertex: (2, -3) axis of symmetry: $x = 2$
 (D) vertex: (2, -3) axis of symmetry: $x = -3$



- D 16. Solve the equation: $-(x + 2) - 2x = -2(x + 1)$
 (A) 1 (B) -1 (C) $\frac{1}{2}$ (D) 0

- D 17. What is the quotient of $(3x^3 + 7x^2 + 5) \div (x + 1)$?
 (A) $3x^2 + 10x + 10, R 15$ (C) $3x^2 - 4x - 4, R 9$ (B) $3x^2 - 10x + 10, R -15$ (D) $3x^2 + 4x - 4, R 9$

- A 18. Find the zeros of $f(x) = (x - 2)^4(x + 6)^5$.
 (A) 2, multiplicity of 4; -6, multiplicity of 5
 (C) 4, multiplicity of 2; -6, multiplicity of 5
 (B) 2, multiplicity of 4; 5, multiplicity of -6
 (D) 4, multiplicity of 2, 5, multiplicity of -6

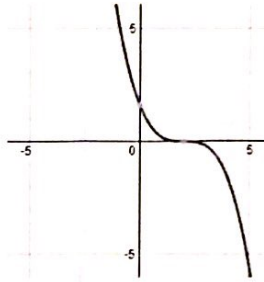
- B 19. Solve the equation: $x^2 + 12x + 61 = 0$.
 (A) -1, -11 (B) $-6 \pm 5i$ (C) $-6 \pm \sqrt{97}$ (D) $-6 \pm i\sqrt{61}$

- D 20. Solve the equation: $4x^2 + 4x - 35 = 0$.
 (A) $x = \frac{5}{4}, x = -7$ (B) $x = -\frac{35}{2}, x = \frac{1}{2}$ (C) $x = -\frac{5}{2}, x = \frac{7}{2}$ (D) $x = \frac{5}{2}, x = -\frac{7}{2}$

C

21. Describe the end behavior of the graph of $f(x)$.

- (A) $\lim_{x \rightarrow -\infty} f(x) = -\infty, \lim_{x \rightarrow \infty} f(x) = -\infty$
- (B) $\lim_{x \rightarrow -\infty} f(x) = -\infty, \lim_{x \rightarrow \infty} f(x) = \infty$
- (C) $\lim_{x \rightarrow -\infty} f(x) = \infty, \lim_{x \rightarrow \infty} f(x) = -\infty$
- (D) $\lim_{x \rightarrow -\infty} f(x) = \infty, \lim_{x \rightarrow \infty} f(x) = \infty$



B

22. Classify the polynomial $x^2 - 4x + 2$ by degree.

- (A) cubic
- (B) quadratic
- (C) quartic
- (D) quintic

A

23. Which of the following is a factor of $3x^2 - x - 4$?

- (A) $(3x - 4)$
- (B) $(3x + 4)$
- (C) $(3x - 1)$
- (D) $(3x + 1)$

B

24. The zeros of a polynomial function $f(x)$ are $-4, 0$ and 2 . The leading coefficient is 1 . What polynomial is this in standard form?

- (A) $f(x) = x^3 - 2x^2 - 8x$
- (B) $f(x) = x^3 + 2x^2 - 8x$
- (C) $f(x) = x^3 - 4x^2 - 8x$
- (D) $f(x) = x^3 + 6x^2 - 8x$

C

25. Solve $4(x - 1)^2 = 28$.

- (A) $1 + \sqrt{7}$
- (B) $1 + 2\sqrt{7}$
- (C) $1 \pm \sqrt{7}$
- (D) $1 \pm 2\sqrt{7}$

D

26. Solve the following system of equations to find the value of x : $x = -2y - 1$
 $2x - y = 13$

- (A) $x = -5$
- (B) $x = -3$
- (C) $x = 3$
- (D) $x = 5$

A

27. Solve the following system of equations: $-3x - 5y = -23$
 $2x - 4y = -14$

- (A) $(1, 4)$
- (B) $(4, -1)$
- (C) $(1, -4)$
- (D) $(-4, 1)$

D

28. Which equation represents a line with a slope of -3 and goes through the point $(1, 5)$?

- (A) $y = 3x + 8$
- (B) $y = 3x - 2$
- (C) $y = -3x - 8$
- (D) $y = -3x + 8$

D

29. Write in standard $a + bi$ form: $(3 - 6i)(9 - 4i)$.

- (A) $-51 - 66i$
- (B) $-3 + 66i$
- (C) $3 - 42i$
- (D) $3 - 66i$

A

30. Given $f(x) = x^2 + 3x - 5$, find $f(-2)$.

- (A) -7
- (B) -3
- (C) -1
- (D) 5

A

31. Write in standard $a + bi$ form: $(3 - 2i) - (9 + 4i)$.

- (A) $-6 - 6i$
- (B) $-6 + 2i$
- (C) $12 - 6i$
- (D) $12 + 2i$

C

32. Which equation represents a line that passes through the point $(5, 7)$ and is parallel to the line $y = 2x + 1$?

- (A) $y - 5 = 2(x - 7)$
- (B) $y - 5 = -\frac{1}{2}(x - 7)$
- (C) $y - 7 = 2(x - 5)$
- (D) $y - 7 = -\frac{1}{2}(x - 5)$

C

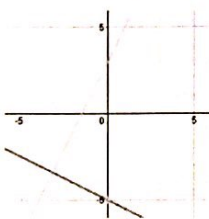
33. What point is a solution of the system of inequalities: $x - 3y > 6$?
 $y \geq -\frac{2}{3}x + 4$

- (A) $(0, 0)$
- (B) $(0, 5)$
- (C) $(10, 0)$
- (D) $(0, -5)$

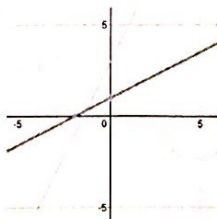
D

34. Which graph represents a system of equations with no solutions?

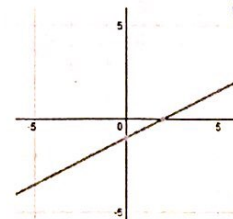
(A)



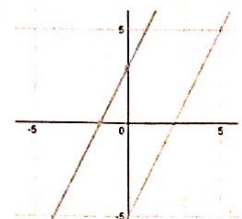
(B)

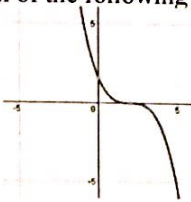
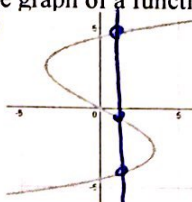
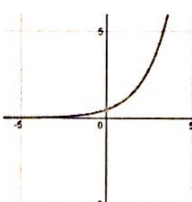
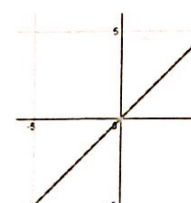


(C)



(D)



- D 35. Evaluate $(x + 1)^2 + 3x$ when $x = -2$.
 (A) -4 (B) 3 (C) 12 (D) -5
- B 36. Which of the following is NOT the graph of a function?
 (A)  (B)  (C)  (D) 
- A 37. Which inequality is the solution of $4(-2x + 2) < 24$?
 (A) $x > -2$ (B) $x > 2$ (C) $x < -2$ (D) $x < 2$
- D 38. Solve $|x + 2| = 12$.
 (A) $x = 10$ or $x = -10$ (B) $x = 14$ or $x = -14$ (C) $x = 14$ or $x = -10$ (D) $x = 10$ or $x = -14$

- B 39. Mr. Geist's class is trying to raise money for a trip to a private chemistry laboratory. The entrance fee for all of the students is a fee of \$4000, and each student's plane ticket will cost \$300. As a result, students are hoping to raise at least \$14,000. Which of the following inequalities represents this scenario?
 (A) $300 + 4000x \geq 14000$ (B) $300x + 4000 \geq 14000$ (C) $300 + 4000x \leq 14000$ (D) $300x + 4000 \leq 14000$

- C 40. Mr. Schumann has some one dollar bills and some five dollar bills in his wallet. He counts them up and notices he has 10 bills. When he figures out how much money he has, it comes to \$27. Which system of equations can be used to find the number n of one dollar bills and f of five dollar bills?
 (A) $n + f = 27$
 $n + 5f = 10$ (B) $n + f = 27$
 $5n + f = 10$ (C) $n + f = 10$
 $n + 5f = 27$ (D) $n + f = 10$
 $5n + f = 27$

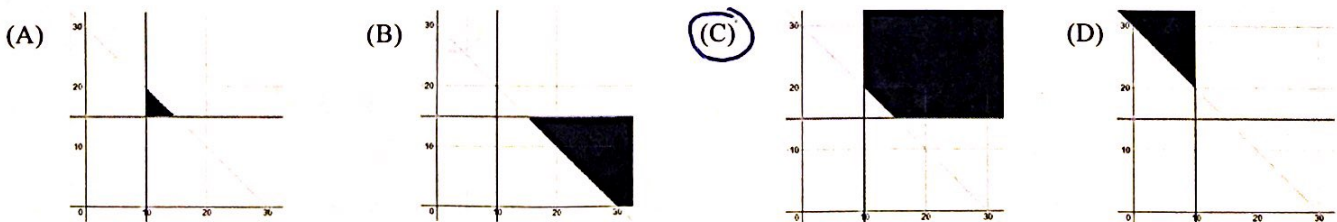
- D 41. Which ordered pair is a solution of the following system of equations: $5x + 6y = -9$ and $-x - 8y = -5$?
 (A) (3, 1) (B) (3, -1) (C) (3, -1) (D) (-3, 1)

- D 42. The Wichman Manufacturing Corporation calculates its revenue R , in millions of dollars, based on c , the number of computers it manufactures, with the following formula $R = -4x^2 + 8x + 12$. Find the Wichman Manufacturing Corporation's maximum revenue.
 (A) \$1 million (B) \$2 million (C) \$8 million (D) \$16 million

- C 43. Walker Office Supply is designing paper with the area to be 99 square inches. The paper area is modeled by the equation $99 = x^2 - 2x$. What value of x is closest to giving the specified area of the paper?
 (A) 9 (B) 10 (C) 11 (D) 12

- A 44. The temperature of freezing water in degrees Celsius is 0°C , while the temperature in degrees Fahrenheit for freezing water is 32°F . The temperature of boiling water in degrees Celsius is 100°C , while the temperature of boiling water in degrees Fahrenheit is 212°F . If the relationship between degree Celsius C and the temperature of degrees Fahrenheit F is linear, which equation models this relationship?
 (A) $F - 212 = \frac{9}{5}(C - 100)$ (B) $F - 212 = \frac{5}{9}(C - 100)$ (C) $F - 100 = \frac{9}{5}(C - 212)$ (D) $F - 100 = \frac{5}{9}(C - 212)$

- C 45. Mr. Geist is making explosives for the United States Army. He needs to make a total of at least 30 explosives. At least 10 of these explosives must be RDX. No more than 15 of these explosives can be mercury fulminate. Let x be the explosives made of RDX, and let y be the explosives made of mercury fulminate. Which of the following graphs would represent this scenario with the black area containing the solutions?



Chapter 1-6 Practice Final Exam

$$1. \frac{7+1}{0+4} = \frac{8}{4} = 2$$

slope = 2 point (0, 7)

$$y - 7 = 2(x - 0)$$

$$y - 7 = 2x - 0$$

$$+7 \qquad +7$$

$$\boxed{y = 2x + 7} \quad \text{B}$$

$$2. \quad x \text{ int: } \frac{4}{3} = 1\frac{1}{3} \quad \text{A}$$

$$y \text{ int: } \frac{4}{2} = 2$$

3.

D

4. graph

$$\begin{array}{r} 2) \quad 1 \quad -2 \quad 1 \quad -2 \\ \underline{\downarrow \quad 2 \quad 0 \quad 2} \\ 1 \quad 0 \quad 1 \quad 0 \end{array}$$

$$\begin{array}{cccc} x^2 & x & c & r \end{array}$$

$$x^2 + \cancel{-1} = 0$$

$$\underline{-1 \quad -1}$$

$$x^2 = -1$$

$$\sqrt{x^2} = \sqrt{-1}$$

$$\boxed{\pm i}$$

$$\boxed{2}$$

C

$$5. \quad (x^2 - 1)(x^2 - 4) = 0$$

$$x^2 - 1 = 0$$

$$x^2 - 4 = 0$$

$$x^2 = 1$$

$$x^2 = 4$$

$$\sqrt{x^2} = \sqrt{1}$$

$$\sqrt{x^2} = \sqrt{4}$$

$$\boxed{\pm 1}$$

$$\boxed{\pm 2}$$

A

6. shift left 2 and down 1
* vertical shrink because wider than parent graph



7. $y \text{ int} : 3(0)^2 - 12(0) + 13 = 13$

Vertex : $\frac{-b}{2a} = \frac{12}{2(3)} = 2$

$3(2)^2 - 12(2) + 13 = 1$



8. shift right 2 and down 3



9. $2x + 3y < 9$

↑ dashed, shade below

x int : $9/2 = 4.5$

y int : $9/3 = 3$



10. both are dashed and both are shaded below



11. V is dashed and shaded above
line is ~~Solid~~ and shaded below



12. $\frac{\text{factors } 2}{\text{factors } 3} = \frac{1, 2}{1, 3} = \pm 1, \pm 2, \pm \frac{1}{3}, \pm \frac{2}{3}$



13. look where it crosses the x-axis

B

14. $x^2 + 8x + 16$
 $(x+4)(x+4)$

B

15. C

16. $-(x+2) = 2x - 2(x+1)$
 $-x - 2 - 2x = -2x - 2$
 $-3x - 2 = -2x - 2$
 $+3x$
 $-2 = x - 2$
 $+2$
 $0 = x$

D

17. -11 $\begin{array}{cccc} 3 & 7 & 0 & 5 \\ \downarrow & -3 & -4 & 4 \\ \hline 3 & 4 & -4 & 9 \end{array}$

D

18. A

19. $\frac{-12 \pm \sqrt{(12)^2 - 4(1)(61)}}{2(1)} = \frac{-12 \pm \sqrt{-100}}{2}$

$\frac{-12 \pm 10i}{2} = -6 \pm 5i$

B

$$20. (2x - 5)(2x + 7) = 0$$

$$\begin{array}{r} 2x - 5 = 0 \\ +5 \quad +5 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{5}{2}$$

$$x = 2.5$$

$$\begin{array}{r} 2x + 7 = 0 \\ -7 \quad -7 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{-7}{2}$$

$$x = -7/2$$

D

21. left side up ∞
right side down $-\infty$

C

22. B

$$23. \quad 3x^2 - x - 4$$

$$(3x - 4)(x + 1)$$

A

$$24. \quad (x + 4)(x - 2)(x)$$

$$x^2 - 2x + 4x - 8$$

$$(x^2 + 2x - 8)(x)$$

$$\boxed{x^3 + 2x^2 - 8x}$$

B

$$25. \quad \frac{4(x-1)^2}{4} = \frac{28}{4}$$

$$(x-1)^2 = 7$$

$$\sqrt{(x-1)^2} = \sqrt{7}$$

$$x - 1 = \pm \sqrt{7}$$

$$\frac{x-1}{+1} = \frac{\pm \sqrt{7}}{+1}$$

$$\boxed{x = 1 \pm \sqrt{7}}$$

C

$$26. \quad X = -2y - 1$$

$$2x - y = 13$$

$$2(-2y - 1) - y = 13$$

$$-4y - 2 - y = 13$$

$$-5y - 2 = 13$$

$$\begin{array}{r} +2 \quad +2 \\ \hline \end{array}$$

$$\frac{-5y}{-5} = \frac{15}{-5}$$

$$y = -3$$

$$x = -2(-3) - 1$$

$$x = 6 - 1$$

$$x = 5$$

D

$$27. \quad 2(-3x - 5y = -23)$$

$$3(2x - 4y = -14)$$

$$-6x - 10y = -46$$

$$6x - 12y = -42$$

$$\frac{-22y}{-22} = \frac{-88}{-22}$$

$$y = 4$$

A

$$28. \quad y - 5 = -3(x - 1)$$

$$y - 5 = -3x + 3$$

$$\begin{array}{r} +5 \quad +5 \\ \hline \end{array}$$

$$y = -3x + 8$$

D

29. $(3-6i)(9-4i)$
 $27 - 12i - 54i + 24i^2$
 $27 - 66i - 24$
 $3 - 66i$

D

30. $(-2)^2 + 3(-2) - 5$
 $4 - 6 - 5$
 $-2 - 5$
 -7

A

31. $(3-2i) - (9+4i)$
 $3 - 2i - 9 - 4i$
 $-6 - 6i$

A

32. $m=2$ point $(5, 7)$
 $y - 7 = 2(x - 5)$

C

33. $10 - 3(0) > 6$ $10 > 6$ true
 plug point $(10, 0)$ in $0 \geq -\frac{2}{3}(10) + 4$ $0 \geq -2.\bar{6}$ true

C

34. parallel lines is no solution

D

35. $(-2 + 1)^2 + 3(-2)$
 $(-1)^2 - 6$
 $1 - 6$
 $\boxed{-5}$

D

36. use vertical line test B

37. $4(-2x + 2) < 24$
 $-8x + 8 < 24$
 $\frac{-8x + 8}{-8} < \frac{24}{-8}$

A

$\frac{-8x}{-8} < \frac{16}{-8}$ switch sign
when \div by a
negative
 $x > -2$

38. $|x + 2| = 12$

$x + 2 = 12$
 $\frac{-2}{-2} \quad \frac{-2}{-2}$
 $x = 10$

$x + 2 = -12$
 $\frac{-2}{-2} \quad \frac{-2}{-2}$
 $x = -14$

D

39. $4000 + 300x \geq 14,000$

B

40. $^s 1n + ^s 5f = ^s 27$
 $n + f = 10$

C

MM

41. $5x + 6y = -9$
 $5(-x - 8y = -5)$

~~$5x + 6y = -9$~~
 ~~$-5x - 40y = -25$~~

 $-34y = -34$
 $\frac{-34}{-34} = \frac{-34}{-34}$

$5x + 6(1) = -9$
 $5x + 6 = -9$
 $\frac{-6}{-6} \quad \frac{-6}{-6}$

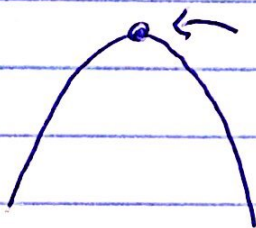
$5x = -15$
 $\frac{5x}{5} = \frac{-15}{5}$

$x = -3$

$y = 1$

D

42.



max is the vertex

$\frac{-8}{2(-4)} = \frac{-8}{-8} = 1$
x value

D

$-4(1)^2 + 8(1) + 12$

$-4(1) + 8 + 12$

$-4 + 8 + 12$

$4 + 12$

$16 \leftarrow \text{max R}$

43. $99 = x^2 - 2x$

$0 = x^2 - 2x - 99$

$0 = (x - 11)(x + 9)$

$11 \quad -9$

C

44. $\begin{matrix} ^\circ\text{C} & \text{of} & ^\circ\text{C} & ^\circ\text{F} \\ (0, 32) & & (100, 212) \end{matrix}$

$$\frac{212 - 32}{100 - 0} = \frac{180}{100} = \frac{18}{10} = \frac{9}{5}$$

slope = $\frac{9}{5}$ point (100, 212)

$$F - 212 = \frac{9}{5} (C - 100)$$

A

45. $\begin{aligned} x + y &\geq 30 \\ x &\geq 10 \\ y &\leq 15 \end{aligned}$

