

Dear Rising 8th Grade Geometry Students and Families,

As we head into summer break, we want to help students keep their math skills sharp and ready for the next school year. Enclosed is a Summer Math Packet designed to review key concepts from Algebra I. Completing this packet will help students retain what they've learned and feel more confident when they begin Geometry in the fall.

The packet includes a variety of practice problems covering important topics such as solving equations & inequalities, graphing linear equations/slope, systems of equations, properties and factoring. A strong foundation in Algebra is important to be successful in Geometry class! Students are encouraged to complete a little bit each week throughout the summer to keep their math thinking active and strong.

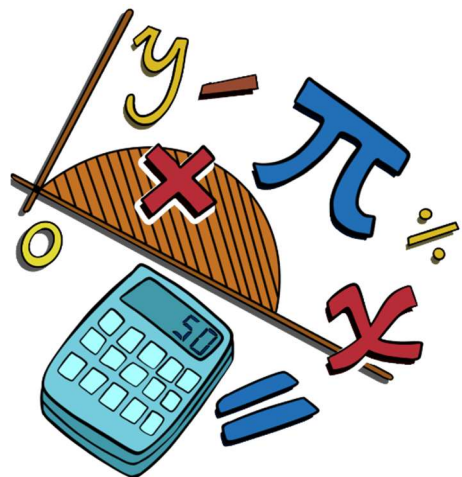
The fully completed packet is due on the first day of school and will count as a completion grade. To avoid a late penalty, it must be turned in on time. As an added incentive, strong performance on the packet will also determine how much extra credit students can receive on our first unit test.

If students come across a topic they are unsure about, we encourage them to use Khan Academy as a free and helpful resource for video tutorials and practice problems. Additionally, students are welcome to reach out to me by email at mmcmenamin@sjesva.org over the summer if they need help or would like guidance on where to start.

Thank you for your support in helping your child maintain their learning over the summer. We hope you have a restful and enjoyable break!

Sincerely,

Mary McMenamin



Name: _____

Algebra I SUMMER REVIEW

Date: _____ Per: _____

SHOW ALL WORK NEEDED TO ANSWER EACH QUESTION! Good Luck! 😊

1. What value of x will make the equation below true?

$$\frac{1}{4}(8x - 20) - 16 = 10x + 51$$

- A.** -4
- B.** 5
- C.** 9
- D.** -9

2. Which equation has no solution?

- F.** $x - 5(x - 4) = 2(2x + 7) + 6$
- G.** $5(x + 1) - 3x = 5 - 2(5 - x)$
- H.** $1 - 3(x + 3) = 2(3x - 4) - 9x$
- J.** $3(x - 4) + x = 4(3 - x)$

3. Identify the property that justifies the work between Step 1 and Step 2.

Step 1: $30 \geq 4x + 2$

Step 2: $30 + (-2) \geq 4x + 2 + (-2)$

Step 3: $28 \geq 4x$

Step 4: $\left(\frac{1}{4}\right)28 \geq \left(\frac{1}{4}\right)4x$

Step 5: $7 \geq x$

- A.** Addition Property of Inequality
- B.** Subtraction Property of Inequality
- C.** Associative Property of Addition
- D.** Identity Property of Addition

4. What value of x makes the inequality true?

$$3(2x - 1) - 11x \leq -3x + 5$$

- F.** $\{x: x \geq -4\}$
- G.** $\{x: x \leq -4\}$
- H.** $\{x: x \geq -1\}$
- J.** $\{x: x \leq -1\}$

5. Find the value of the expression below

when $x = \frac{3}{4}$.

$$4x^2 + 8x - 5$$

- A.** 10
- B.** 4
- C.** $\frac{13}{4}$
- D.** $\frac{53}{4}$

6. Which statement is justified by the transitive property of equality?

- F. $(x + y) + z = x + (y + z)$
 G. If $7x = 14$, then $14 = 7x$
 H. If $-3x = y$, and $y = 8z$, then $-3x = 8z$
 J. $x(y - z) = xy - xz$

7. Evaluate the expression below if $a = 64$, $b = 9$, and $c = 5$

$$\frac{12b - 2^c}{\sqrt[3]{a}}$$

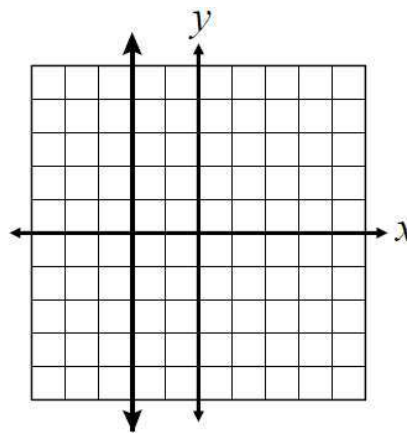
- A. 19
 B. $\frac{19}{2}$
 C. $\frac{49}{4}$
 D. $\frac{49}{2}$

8. The formula below gives the sum of the degrees, S , of the interior angles of a polygon. If n represents the number of sides, which equation solves for n ?

$$S = (n - 2) \cdot 180$$

- F. $n = \frac{S}{180} + 2$
 G. $n = 180S + 2$
 H. $n = \frac{S + 2}{180}$
 J. $n = (S + 2) \cdot 180$

9. What is most likely the slope of the line graphed?

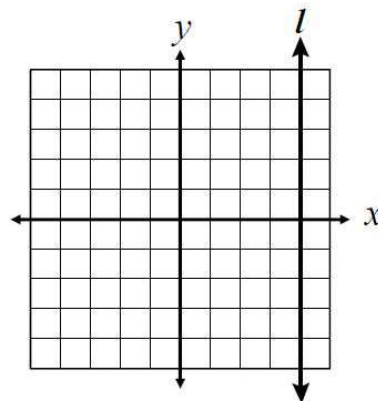


- A. -2
 B. 0
 C. 2
 D. undefined

10. Find the slope of the line between the coordinates $(-6, -13)$ and $(3, -1)$.

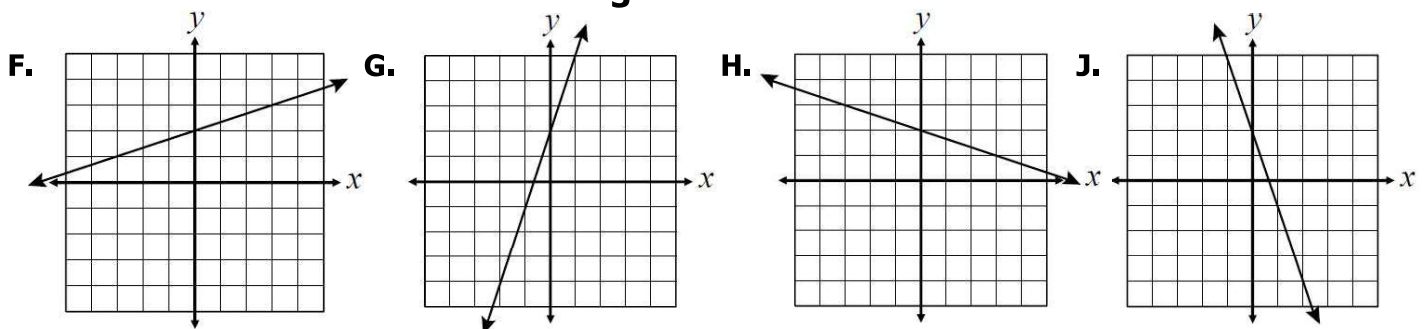
- F. $\frac{3}{4}$
 G. $\frac{4}{3}$
 H. $-\frac{3}{4}$
 J. $-\frac{4}{3}$

11. Which line best models line l ?



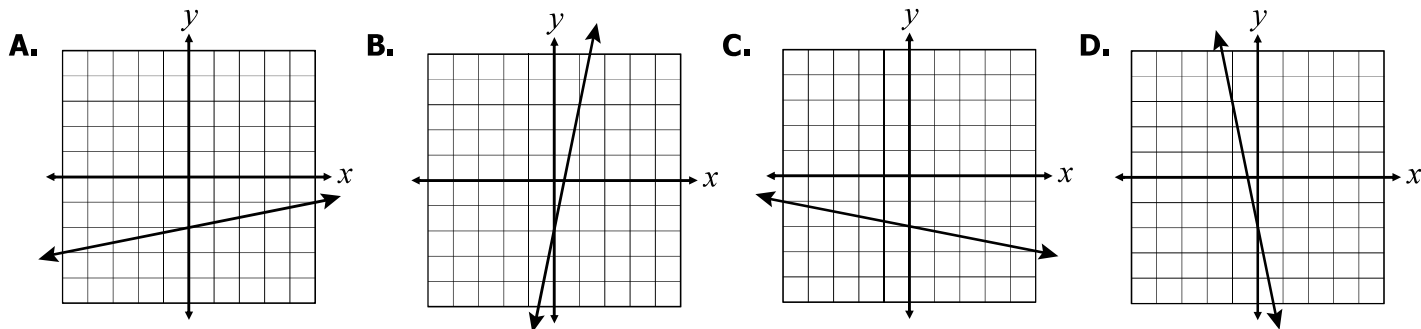
- A. $x = 4$
 B. $y = 4$
 C. $x = 4y$
 D. $y = x + 4$

12. Which best represents the line $y = -\frac{1}{3}x + 2$?



13. Which best represents the equation of the line below?

$$5x - y = 2$$



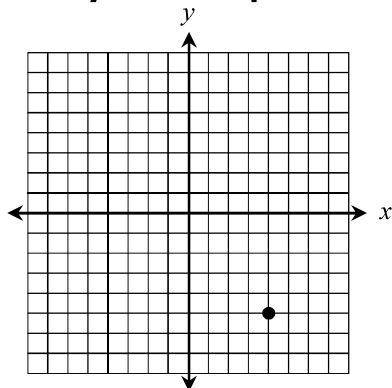
14. Which is an equation of the line that passes through the points (5, 2) and (10, -3)?

- F. $y = x - 3$
- G. $y = x - 8$
- H. $y = -x + 7$
- J. $y = -x + 12$

15. A line passes through the point (3, -1) and has a slope of $-\frac{2}{3}$. Which of the following points also lies on this line?

- A. (9, 5)
- B. (-3, 1)
- C. (6, 3)
- D. (-9, 7)

16. Which system of equations results in the solution plotted on the grid?



F. $\begin{cases} x = -5 \\ x - 4y = 24 \end{cases}$

H. $\begin{cases} 3x + 2y = 2 \\ x - y = 1 \end{cases}$

G. $\begin{cases} 3x - y = -7 \\ 4x = 5y \end{cases}$

J. $\begin{cases} x + y = -1 \\ x - 2y = 14 \end{cases}$

17. Which ordered pair represents the solution to the system of equations?

$$\begin{cases} 2x - 7y = 0 \\ x - 6y = -5 \end{cases}$$

- A. (7, 2)
- B. (2, 7)
- C. (1, 1)
- D. (-11, -1)

18. Describe the type of solution for the linear system of equations given below.

$$\begin{cases} x + 4y = 7 \\ 8y = 14 - 2x \end{cases}$$

- F. no solution
- G. infinite solutions
- H. one solution
- J. two solutions

19. Jack paid \$13.75 to buy 3 slices of pizza and 4 hot dogs at a concession stand. Sarah paid \$9.75 to buy 2 slices of pizza and 3 hot dogs from the same concession stand. What was the price of a slice of pizza?

A. \$1.50
B. \$1.75
C. \$2.00
D. \$2.25

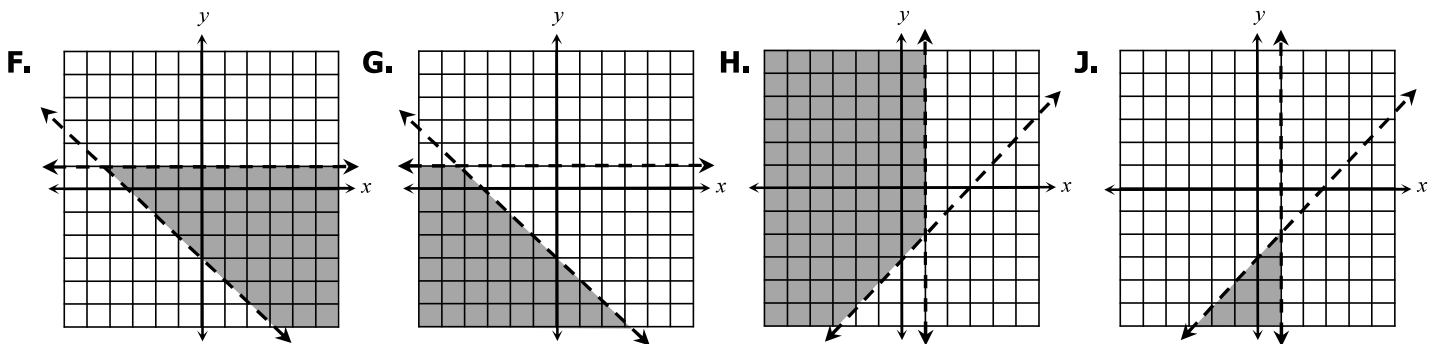
20. Which inequality is equivalent to $4x - 2y \leq 8$?

F. $y \leq 2x - 4$
G. $y \geq 2x - 4$
H. $y \leq -2x - 4$
J. $y \geq -2x - 4$

21. For which system of inequalities is $(-7, -2)$ a solution?

A. $\begin{cases} x + y > -9 \\ 2x - 5y > -4 \end{cases}$
B. $\begin{cases} x + y < -8 \\ 2x - 5y > -4 \end{cases}$
C. $\begin{cases} x + y \geq -8 \\ 2x - 5y \geq -5 \end{cases}$
D. $\begin{cases} x + y \geq -9 \\ 2x - 5y > -5 \end{cases}$

22. Which graph shows the solution to the following system of inequalities: $\begin{cases} x < 1 \\ x - y < 3 \end{cases}$



23. What is the simplified form of the expression below?

$$\frac{(3m^4n)^3(2m^2n^5p)}{6m^4n^9p^8}$$

A. $9m^5np^7$
B. $\frac{m^{10}}{np^7}$
C. $\frac{m^5n^6}{p^7}$
D. $\frac{9m^{10}}{np^7}$

24. What is the simplified form of $(-5x^{-3}y^4)^2$?

F. $\frac{10y^8}{x^6}$
G. $\frac{25y^8}{x^6}$
H. $\frac{-10y^8}{x^6}$
J. $\frac{-25y^8}{x^6}$

25. What missing exponent makes the statement true?

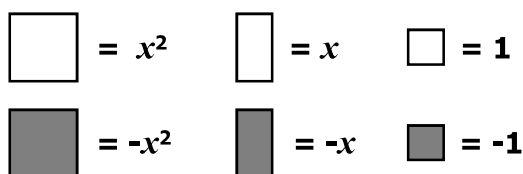
$$\frac{w^{\boxed{?}}}{w^{-2}} = \frac{1}{w^6}$$

- A. -8
- B. -12
- C. 8
- D. 12

26. If the dimensions of a rectangular garden can be represented by $(2x + 11)$ and $(3x + 5)$, then what is the area of the garden?

- F. $5x + 16$
- G. $5x^2 + 43x + 55$
- H. $6x^2 + 43x + 55$
- J. $6x^2 + 43x + 16$

Use the models below for questions 27.



27. Which polynomial is represented by the following diagram?



- A. $(x^2 - 2x - 4) + (x^2 + 2x - 1)$
- B. $(3x^2 - 7x + 1) - (x^2 - 3x + 4)$
- C. $(2x + 1)(x - 3)$
- D. $\frac{8x^{12} - 16x^7 - 12x^6}{4x^6}$

28. When completely factored, $2x^3 - 200x$ equals –

- F. $2x(x^2 - 100)$
- G. $2x(x - 10)(x - 10)$
- H. $2x(x + 10)(x - 10)$
- J. $2x(x + 50)(x - 50)$

29. For which value of b would $x^2 + bx - 24$ be prime?

- A. 3
- B. 5
- C. 10
- D. 23

30. Which of the following binomials is a factor of the expression $8y^2 - 10y - 3$?

- F. $(4y - 1)$
- G. $(4y + 1)$
- H. $(2y + 3)$
- J. $(y - 3)$

31. Which of the polynomials below have a binomial factor of $(x - 4)$?

I.	$x^2 - 4x - 32$
II.	$2x^2 + x - 36$
III.	$x^2 - 10x + 24$
IV.	$x^2 - 16x$

- A. I and III
- B. II, III, and IV
- C. III only
- D. II and III

32. In simplest form, $\sqrt{845}$ is equal to –

- F. 13
- G. $13\sqrt{2}$
- H. $13\sqrt{3}$
- J. $13\sqrt{5}$

33. What is $\sqrt[3]{2187}$ in simplest form?

- A. $3\sqrt[3]{9}$
- B. $3\sqrt[3]{81}$
- C. $9\sqrt[3]{3}$
- D. $27\sqrt[3]{3}$

34. Written in simplest radical form, $\sqrt{192a^{36}b^9}$ is equal to –

- F. $4a^6b^3\sqrt{12}$
- G. $4a^{18}b^4\sqrt{12b}$
- H. $8a^6b^3\sqrt{3}$
- J. $8a^{18}b^4\sqrt{3b}$

35. Which of the following values for x will make relation A shown below a function?

$$A = \{(3, 5), (4, 9), (7, 2), (x, 6)\},$$

- A. 3
- B. 4
- C. 5
- D. 7

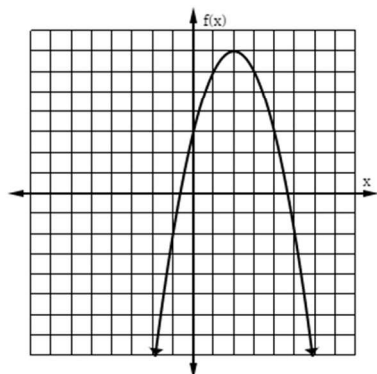
36. What is $h(-8)$ for $h(x) = \frac{1}{4}x^2 + 7x$?

- F. -40
- G. -72
- H. -52
- J. -60

37. If $f(-2) = 16$, which could be the equation for $f(x)$?

- A. $f(x) = x - 18$
- B. $f(x) = 20 - 2x$
- C. $f(x) = 3x + 24$
- D. $f(x) = 8 - 4x$

38. The graph of function $f(x)$ is shown below. What is $f(1) - f(5)$?



- F. -6
- G. -4
- H. 4
- J. 8

39. What are the range values of the function $f(x) = -3x^2 + 5$ for the domain values $\{-2, 0, 1\}$?

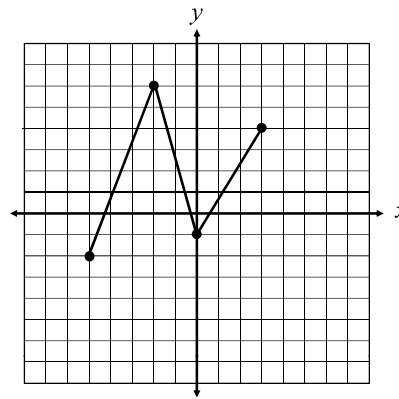
- A. $\{-31, -4, 5\}$
- B. $\{-7, 2, 5\}$
- C. $\{5, 8, 17\}$
- D. $\{5, 14, 41\}$

40. What is the domain of the relation shown in the table below?

x	-5	-2	0	3	6
y	-23	-14	-8	1	10

- F. $\{-5, -2, 0, 3, 6\}$
 G. $\{-23, -14, -8, 1, 10\}$
 H. $\{-23, -14, -8, -5, -2, 0, 1, 3, 6, 10\}$
 J. $\{(-5, -23), (-2, -14), (0, -8), (3, 1), (6, 10)\}$

41. What is the range of the function shown?



- A. $\{x: -2 \leq x \leq 6\}$
 B. $\{x: -5 \leq x \leq 3\}$
 C. $\{y: -2 \leq y \leq 6\}$
 D. $\{y: -5 \leq y \leq 3\}$

42. A function g is described below:

- $g(x) = 2(x - 3)^2 - 5$
- The domain of g is all real numbers greater than 0.

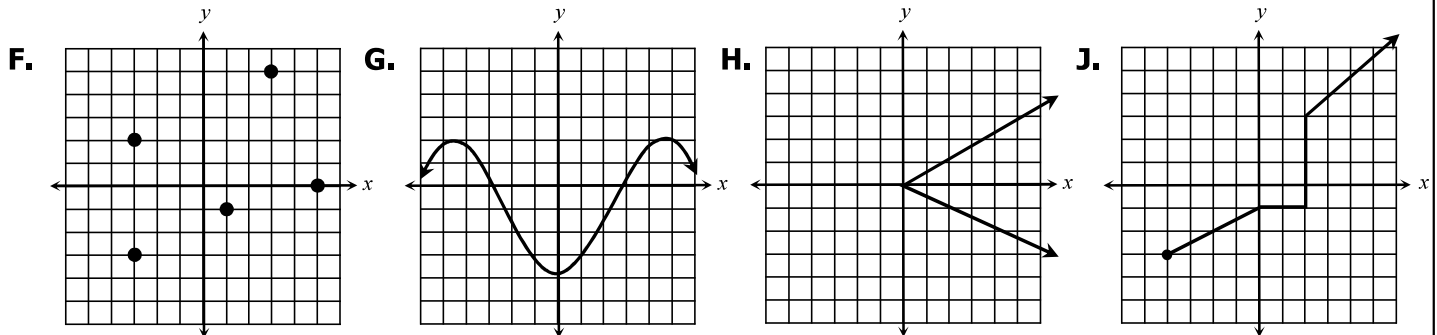
The range of g is all real numbers greater than or equal to –

- F. 5
 G. -5
 H. 3
 J. -3

43. Which function has an x -intercept at $(-1, 0)$ and a y -intercept at $(0, 4)$?

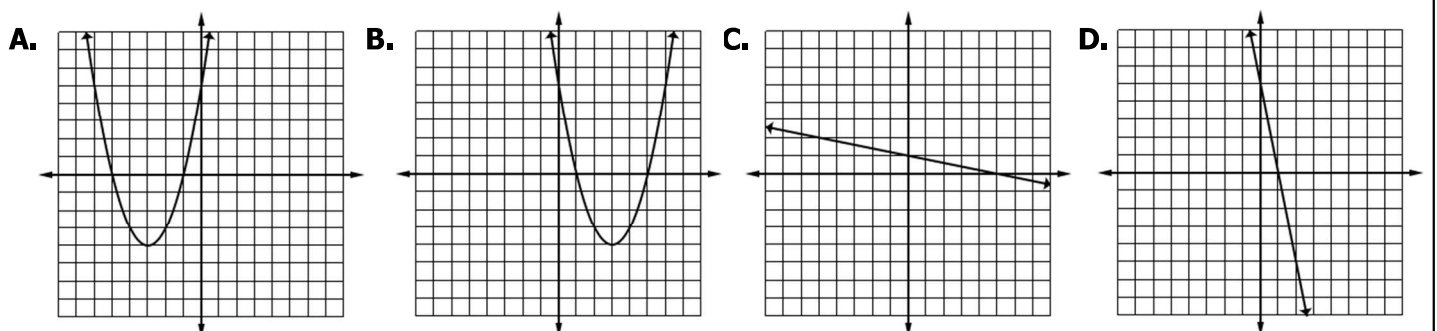
- A. $y = -x + 4$
 B. $x - 4y = 4$
 C. $y = (x - 1)^2 + 4$
 D. $y = -x^2 + 3x + 4$

44. Which of the following graphs appears to represent a function?

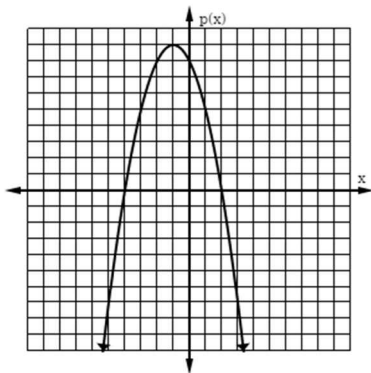


45. Which graph represents the function below?

$$f(x) = (x + 1)(x + 5)$$



46. The graph of $p(x) = -x^2 - 2x + 8$ is shown. Identify each solution to $p(x) = 0$.



- F. $\{-4, 2, 8\}$
 G. $\{-4, 2\}$
 H. $\{-4, 8\}$
 J. $\{-2, 4\}$

47. Which quadratic equation has roots of 5 and 7?

- A. $y = x^2 + 2x - 35$
 B. $y = x^2 - 2x - 35$
 C. $y = x^2 + 12x + 35$
 D. $y = x^2 - 12x + 35$

48. Which of the following is a solution to $4x^2 + 8x - 12 = 0$?

- F. -1
 G. -3
 H. 3
 J. 0

49. What are the solutions of the equation $10x^2 + x = 2$?

- A. $\left\{-\frac{1}{2}, \frac{2}{5}\right\}$
 B. $\left\{-\frac{2}{5}, \frac{1}{2}\right\}$
 C. $\left\{-5, \frac{1}{2}\right\}$
 D. $\left\{-\frac{1}{2}, 5\right\}$

50. What are the solutions to the equation $2 - 4x^2 = -110$?

- F. $x = \{\pm 3\sqrt{3}\}$
 G. $x = \{\pm 9\sqrt{3}\}$
 H. $x = \{\pm 2\sqrt{7}\}$
 J. $x = \{\pm 4\sqrt{7}\}$

51. What are the solutions to the equation $-x^2 - 2x + 47 = 0$?

- A. $x = \{1 \pm 7\sqrt{3}\}$
 B. $x = \{-1 \pm 3\sqrt{7}\}$
 C. $x = \{1 \pm 16\sqrt{3}\}$
 D. $x = \{-1 \pm 4\sqrt{3}\}$

52. Which functions below have a zero of -5?

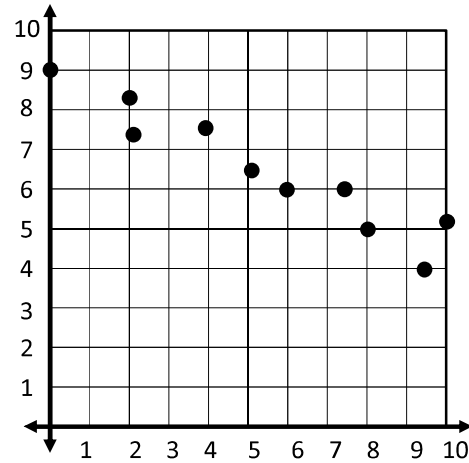
I.	$p(x) = x^2 + 7x + 10$
II.	$h(x) = 2(x + 5)(x - 5)$
III.	$g(x) = 6(x - 5)$
IV.	$f(x) = 3x^2 - 15x$
V.	$k(x) = 4x^2 + 17x - 15$

- F. II and III
 G. II, III, and IV
 H. I, II, and V
 J. I, II, IV, and V

53. The path of a firecracker is modeled by the equation $h(t) = -t^2 + 19t + 14$, where $h(t)$ is the height, in feet, of the firecracker at any given time, t . What is the height of the firecracker after 4 seconds from launch?

- A. 63 feet
- B. 68 feet
- C. 70 feet
- D. 74 feet

54. Which is most likely the equation of the line of best fit for the set of data points?



- F. $y = 2x + 9$
- G. $y = -2x + 9$
- H. $y = \frac{1}{2}x + 9$
- J. $y = -\frac{1}{2}x + 9$