

Complete the follow problems before returning to school in the fall. Using apps such as PhotoMath or AI generated solutions will stunt your success in this class. You will be responsible for knowing the information in this packet. If you need help, please consider the summer math camp. We will be going over this packet.

1.

$$f(x) = \begin{cases} 2x + 8 & \text{for } -5 \leq x < -1 \\ -6 & \text{for } x = -1 \\ x + 5 & \text{for } -1 < x \leq 2 \end{cases}$$

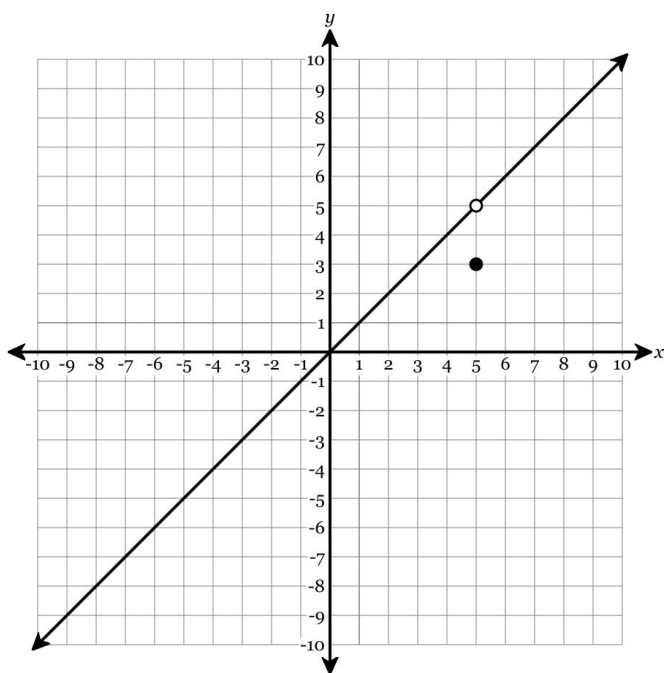
Find $f(-1)$

2.

$$f(x) = \begin{cases} -(x + 3)^2 - 1 & \text{for } x \leq -1 \\ -x & \text{for } x > 2 \end{cases}$$

Find $f(-5)$

3. Evaluate the function graphically.

Find $f(9)$

4.

$$f(x) = \begin{cases} -x + 1 & \text{for } x < -1 \\ 1 & \text{for } x = -1 \\ x + 3 & \text{for } -1 < x \leq 3 \end{cases}$$

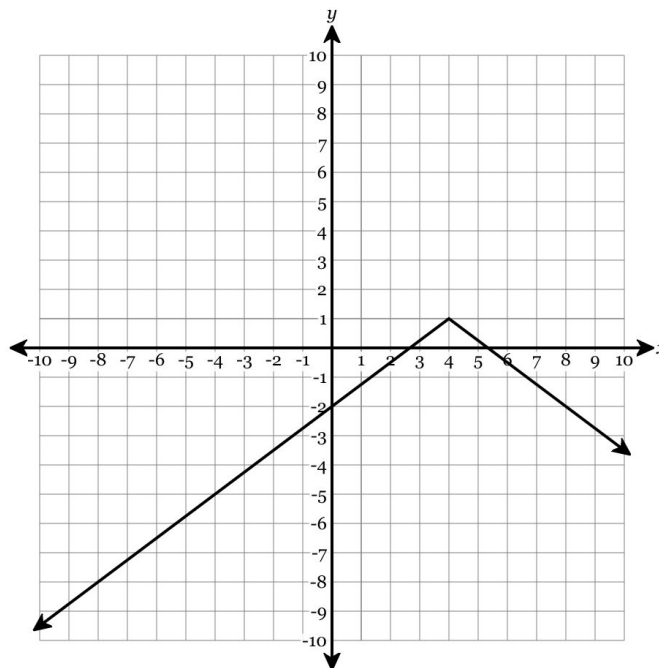
Find $f(8)$

5.

$$f(x) = \begin{cases} -(x - 4)^2 & \text{for } x \neq 5 \\ 3 & \text{for } x = 5 \end{cases}$$

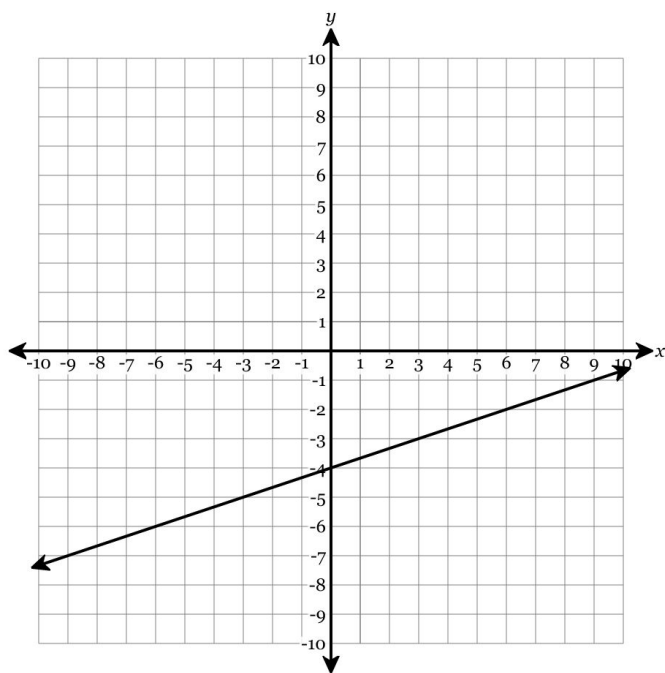
Find $f(5)$

6. Identify which type of function is graphed below.



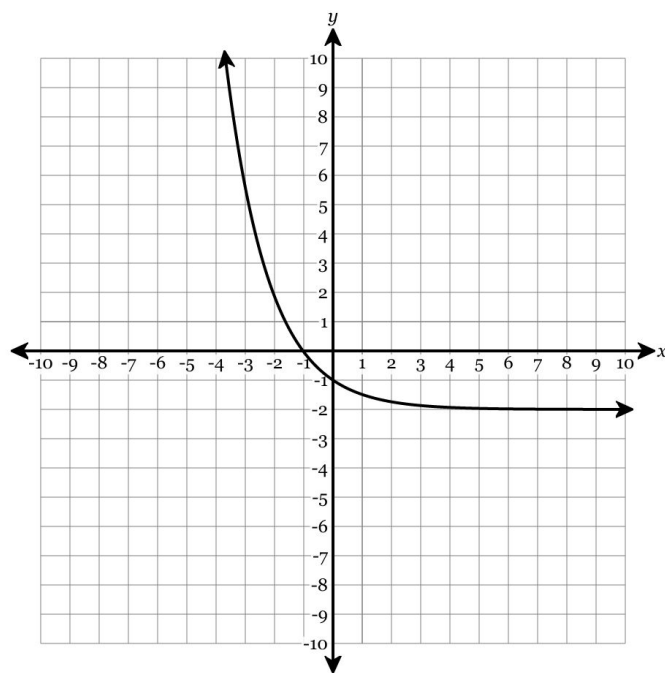
- A. cubic
- B. cube root
- C. absolute value
- D. quadratic

7. Identify which type of function is graphed below.



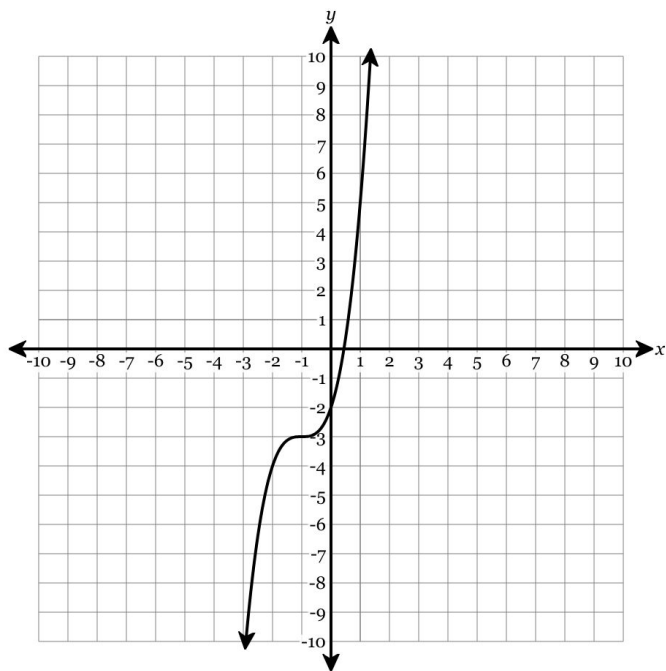
- A. exponential
- B. absolute value
- C. linear
- D. square root

8. Identify which type of function is graphed below.



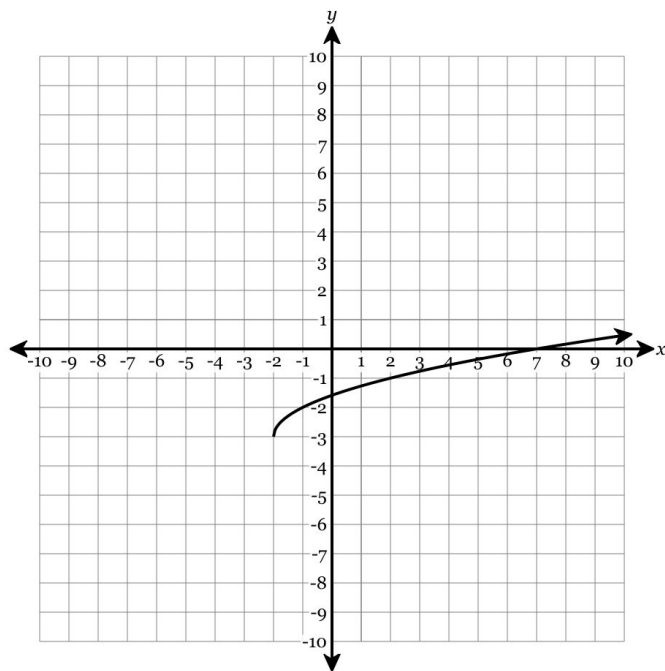
- A. linear
- B. exponential
- C. cube root
- D. cubic

9. Identify which type of function is graphed below.



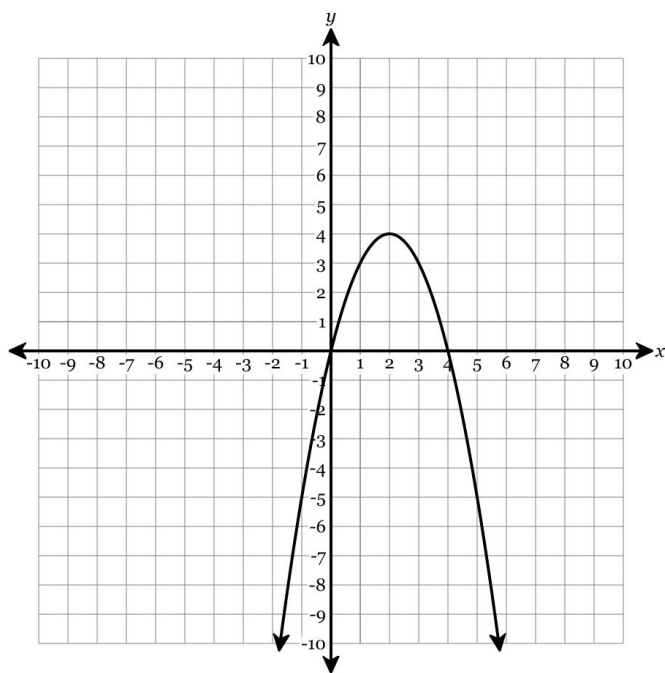
- A. absolute value
- B. cubic
- C. exponential
- D. square root

10. Identify which type of function is graphed below.



- A. quadratic
- B. linear
- C. cube root
- D. square root

11. Identify which type of function is graphed below.



- A. quadratic
- B. absolute value
- C. exponential
- D. linear

12. Solve the equation for all values of x by *completing the square*.

$$3x^2 + 42 = -24x$$

13. Solve the equation for all values of x by *completing the square*.

$$5x^2 - 10x = 15$$

14. Use the quadratic formula to solve. Express your answer in simplest form.

$$6w^2 - 26w + 5 = w^2$$

15. Solve the equation for all real solutions in simplest form.

$$6q^2 + 2q - 7 = 3q^2$$

16. Perform the operation.

$$(-3x^2 + 3x - 8) + (6x^2 - 4x)$$

17. Perform the operation.

$$(-8x + 10) - (3x^2 - x + 6)$$

18. If $B = 1 - q$ and $C = 3q - q^2 - 1$, find an expression that equals $B - C$ in standard form.

19. Write the following expression as a simplified polynomial in standard form.

$$3(x - 3)^2 - 4(x - 3) - 1$$

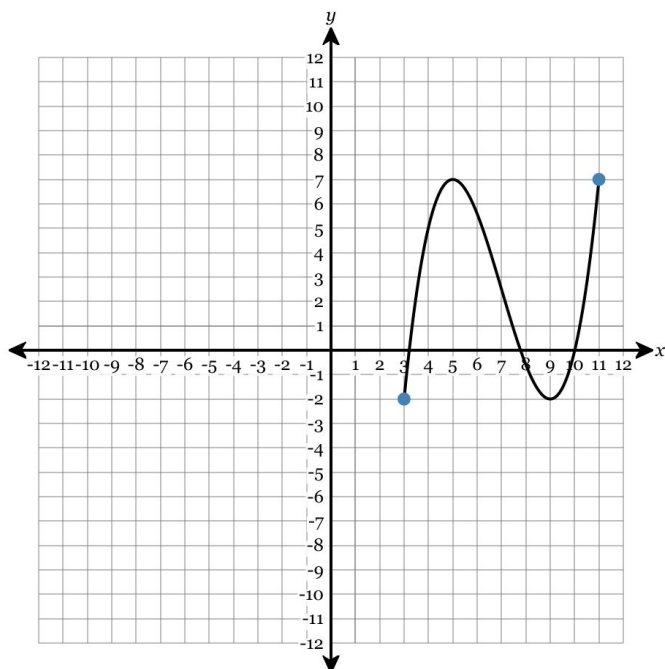
20. Solve the following equation for A .

$$m = \sqrt{dA + 3g}$$

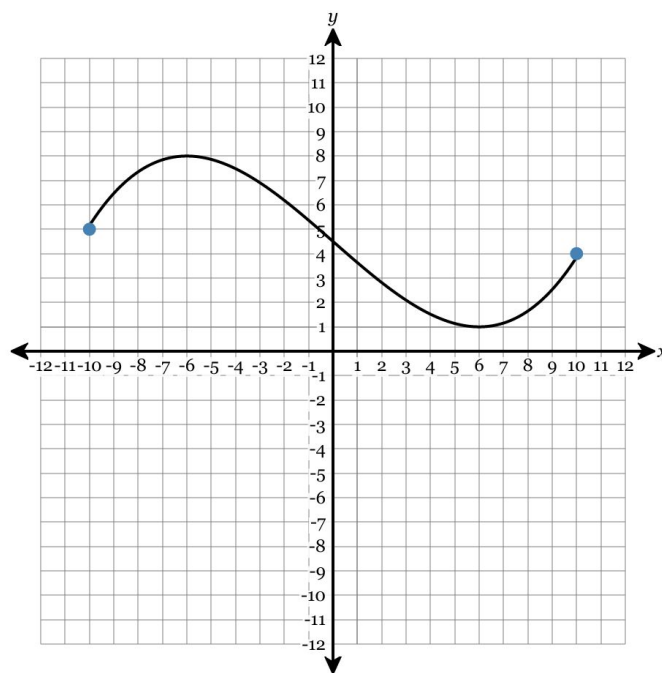
21. Solve the following equation for d .

$$-h + \frac{1}{5}td = f$$

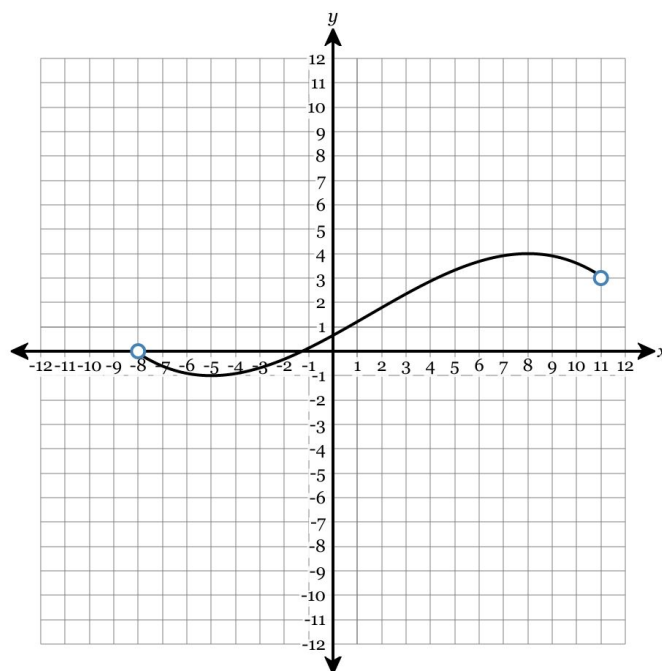
22. Determine the range of the following graph:



23. Determine the range of the following graph:



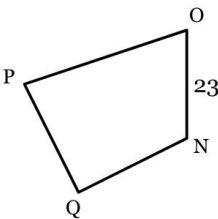
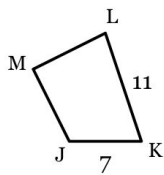
24. Determine the domain of the following graph:



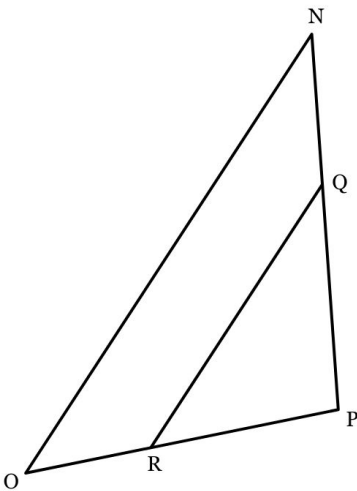
25. Solve for x and simplify the answer fully.

$$\frac{x - 4}{3} = \frac{x - 9}{2}$$

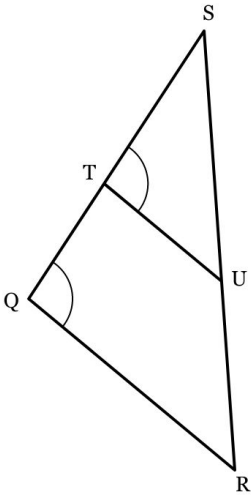
26. Quadrilateral JKLM is similar to quadrilateral NOPQ. Find the measure of side OP. Round your answer to the nearest tenth if necessary. Figures are not drawn to scale.



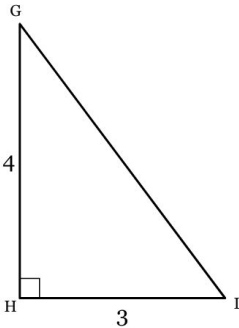
27. Given $\triangle NOP \sim \triangle QRP$. Write another ratio of segments equivalent to $\frac{OP}{RP}$.



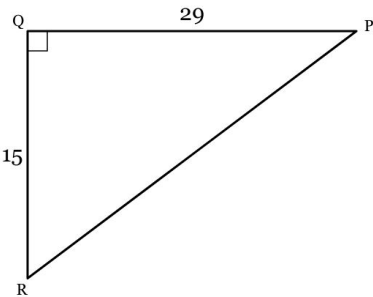
28. Write another ratio of segments equivalent to $\frac{US}{TU}$.



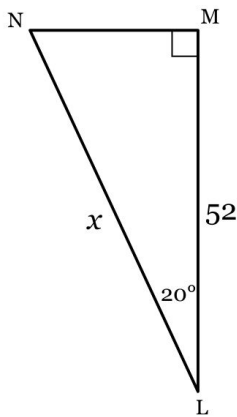
29. Express $\sin G$ as a fraction in simplest terms.



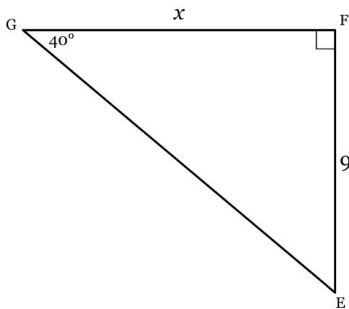
30. Express $\tan P$ as a fraction in simplest terms.



31. Solve for x . Round to the nearest tenth, if necessary.



32. Solve for x . Round to the nearest tenth, if necessary.



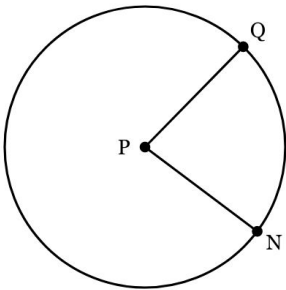
33. Find the midpoint of the segment with the following endpoints.

$(-2, 3)$ and $(-6, 9)$

34. Find the distance between the two points in simplest radical form.

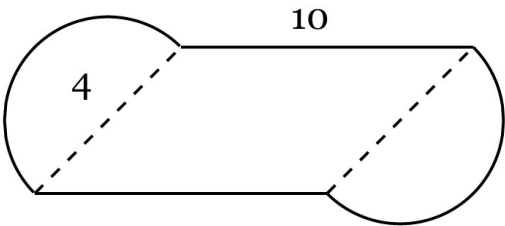
$(-9, 9)$ and $(0, -3)$

35. In circle P with the measure of arc $\widehat{NQ} = 82^\circ$, find $m\angle NPQ$.

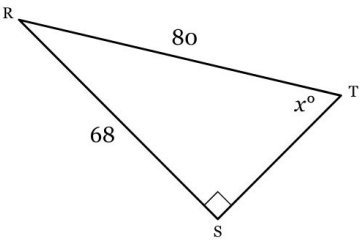


36. The circumference of a circle is 16π in. Find its diameter, in inches.

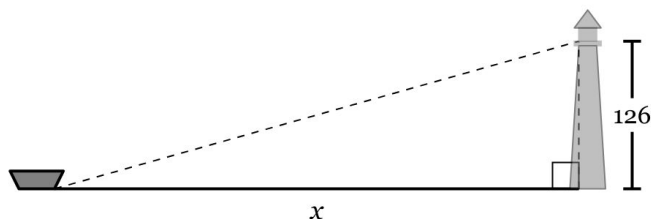
37. Find the Perimeter of the figure below, composed of a parallelogram and two semicircles. Round to the nearest tenths place.



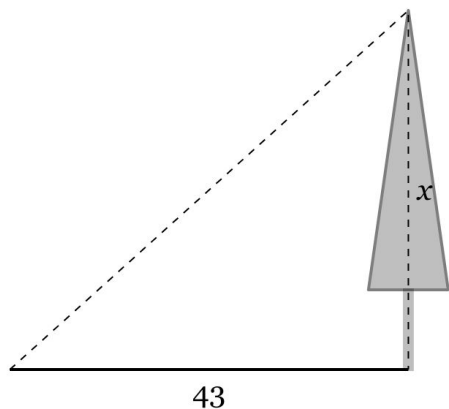
38. Solve for x . Round to the nearest tenth of a degree, if necessary.



39. A boat is heading towards a lighthouse, whose beacon-light is 126 feet above the water. The boat's crew measures the angle of elevation to the beacon, 15° . What is the ship's horizontal distance from the lighthouse (and the shore)? Round your answer to the nearest tenth of a foot if necessary.



40. The angle of elevation to a nearby tree from a point on the ground is measured to be 42° . How tall is the tree if the point on the ground is 43 feet from the bottom of the tree? Round your answer to the nearest tenth of a foot if necessary.



41. Express the following fraction in simplest form, only using positive exponents.

$$\frac{-3(q^{-2}a^5)^3}{15q^8a^5}$$

42. Express in simplest form with a rational denominator.

$$\frac{7}{\sqrt{18}}$$

43. Given $x > 0$, simplify $\sqrt[3]{8x^6}$ completely.

44. Express as a fraction in simplest form with a rational denominator:

$$\frac{8}{1 - \sqrt{14}}$$

45. Given $x > 0$, the expression $\sqrt[4]{x^{13}}$ is equivalent to

- A. $x^2\sqrt[4]{x^2}$ B. $x^3\sqrt[4]{x}$
C. x^3 D. x^4

46. Evaluate: i^{79}

- A. 1 B. -1 C. i D. $-i$

47. Evaluate: $i^{20} \cdot i^{32} \cdot i^{19}$

- A. $-i$ B. -1 C. 1 D. i

48. Simplify the expression to a + bi form:

$$(2 - 7i) - (-2 + 6i)$$

49. Factor completely.

$$15z^4 - 9x^3y^3z^5$$

50. Solve the equation for *all values* of x .

$$49x^2 - 81 = 0$$

51. Factor completely: $2x^3 - 10x^2 - 48x$

52. Use factor by grouping to factor the following expression completely.

$$x^3 + x^2 + 16x + 16$$

53. Factor the expression completely: $x^4 - x^2 - 42$

54. Factor Completely

$$-4s^4 - 112s$$

55. Factor Completely

$$16d^4 - 36d^3$$

56. Use the long division method to find the result when $x^3 + 5x^2 + 6x + 2$ is divided by $x + 1$.

57. Use synthetic division to find the result when $4x^4 - 2x^3 - 17x^2 + 14x + 10$ is divided by $x + 2$.

If there is a remainder, express the result in the form $q(x) + \frac{r(x)}{b(x)}$.

58. How many x-intercepts would the function shown below have?

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

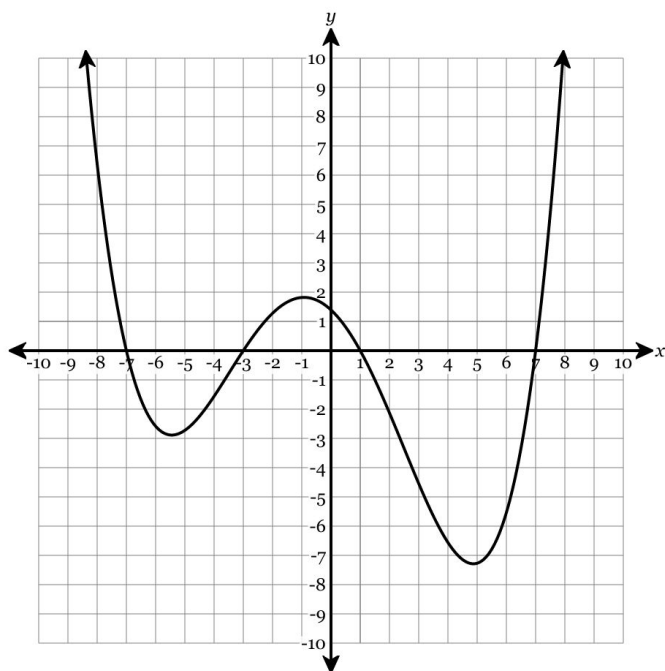
59. How many x-intercepts would the function shown below have?

$$f(x) = x^2(x^2 - 2)(4x + 1)$$

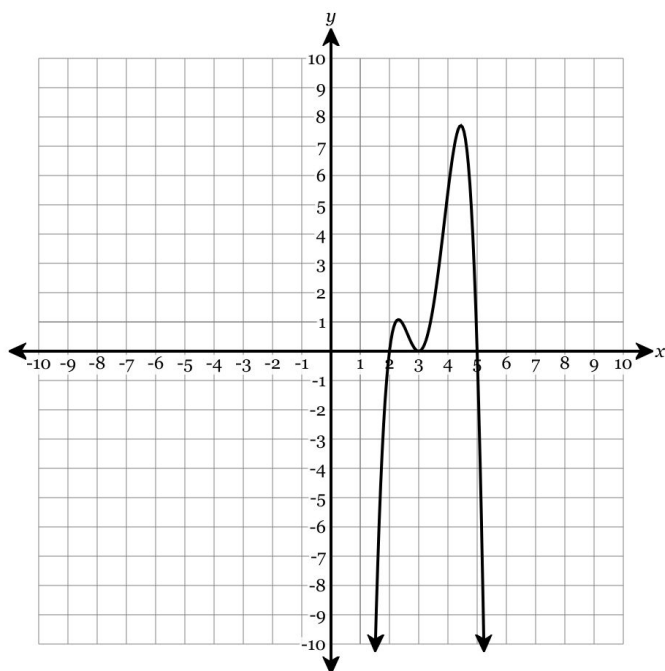
60. Find the *y-coordinate* of the y-intercept of the polynomial function defined below.

$$f(x) = (x + 3)(x + 2)(5x^2 - 1)$$

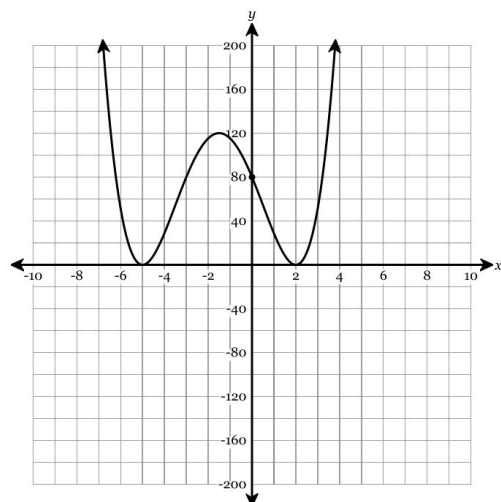
61. The graph of $y = f(x)$ is shown below. What are all of the real solutions of $f(x) = 0$?



62. The graph of $y = f(x)$ is shown below. What are all of the real solutions of $f(x) = 0$?



63. Write a function in any form that would match the graph shown below.



64. Express the interval using inequality notation.

$$[-9, -1]$$

65. Express the inequality using interval notation.

$$x \leq -8 \text{ or } x \geq 3$$

66. Express the inequality using interval notation.

$$x < 3$$

67. Express the inequality using interval notation.

$$-1 < x < 8$$

68. Which interval notation represents the set of all numbers greater than or equal to -9 and less than or equal to 11?

- A. $[-9, 11)$
- B. $(-9, 11]$
- C. $[-9, 11]$
- D. $(-9, 11)$

69. The set $S = \{x \mid -4 < x < 3\}$ is described by which interval notation?

- A. $(-4, 3)$
- B. $(-4, 3]$
- C. $[-4, 3]$
- D. $[-4, 3)$

70. Which interval notation represents the set of all numbers from -9 to 8, not inclusive?

- A. $(-9, 8)$
- B. $(-9, 8]$
- C. $[-9, 8)$
- D. $[-9, 8]$