

1. Solve algebraically. $y = -2x + 5$
 $y - 3x = 0$

2. Find the coordinates of A if the midpoint of \overline{AB} is (2, 3) and B = (1, 8).

3. Find the distance and the midpoint of the following coordinates.
 - a) M(3,3) A(15,12)
 - b) T(-2,-1) H(4,9)

4. Find the slope of \overline{MA} and \overline{TH} .

5. State which lines are perpendicular, parallel, or neither.
 - A) $3y = 5x - 3$
 - B) $-5y + 10 = 3x$
 - C) $6y = 10x + 1$

6. Write the slope-intercept form of the equation of the line passing through (5, 0) and having slope of $\frac{1}{7}$.

7. There is a correlation between the height of human and their ulna bone. Aiden is 66" tall and his ulna bone is 11". Blake is 36" tall and his ulna bone is 6". Write a linear equation relating ulna length (y), to the height (x).

8. Simplify.

a) $(5 - 8i) - (10 - 3i)$

b) $(1+i)^2$

9. What are the roots of:
 $x^2 + 5x + 6 = 0$

10. What are the solutions of:
 $x^2 + 2x + 5 = 0$

11. What is the axis of symmetry and vertex of: $y = -2x^2 + 10x - 4$.

12. When a ball is thrown upward, its approximate height in meters t seconds later is given by $h(t) = 36 + 24t - 5t^2$. When will the ball reach its highest elevation? What is the height at that particular time?

13. Which of the following is a root of $2x^4 - x^3 - 4x^2 + 8x - 5 = 0$?

a) 1

b) 2

c) 3

d) 4

14. Which of the following is a factor of $x^3 - 5x^2 + 11x - 10$?

a) $x + 2$

b) $x - 2$

c) $x + 1$

d) $x - 3$

15. $(x + 3)$ is a factor of which of the following?

a) $x^3 + 2x + 15$

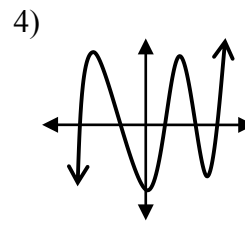
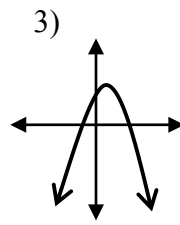
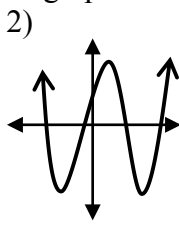
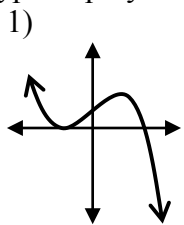
b) $-x^3 + 4x + 15$

c) $x^3 - 4x + 15$

d) $x^3 + 4x + 15$

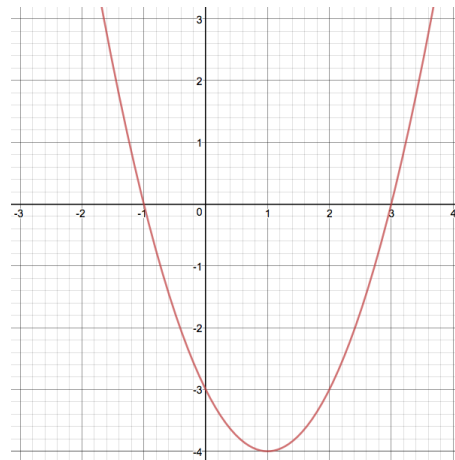
16. Match the following type of polynomials to the graphs.

- A) Quadratic
- B) Cubic
- C) Quartic
- D) Quintic



17. Which equation represents the graph of the function to the right?

- a. $y = x^2 - 3$
- b. $y = x^2 + x + 4$
- c. $y = x^2 - 2x - 3$
- d. $y = x^2 - 4x + 1$



18. Find a quadratic equation that has roots of 5 and -1?

19. What is the maximum point of the graph of $y = -x^2 + 2x + 1$?

20. What type of zeros does the function $f(x) = x^3 - x^2 + 9x - 9$ have?

21. What are all the rational roots of $f(x) = 5x^3 + 4x^2 + 1$?

22. Find the sum and product of the roots of the equation $2x^3 - 5x^2 + x - 3 = 0$.

Solve the following inequalities #23 – 26.

23. $-2(x + 3) - 11 \geq 4$.

24. $|4x - 1| < 2$

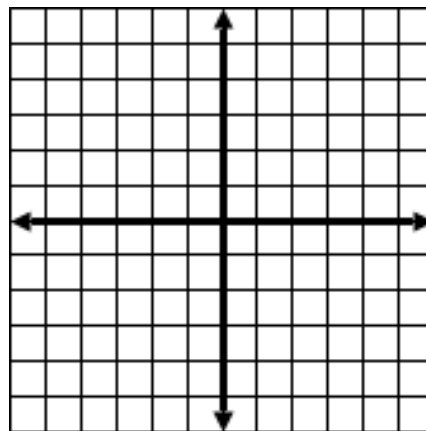
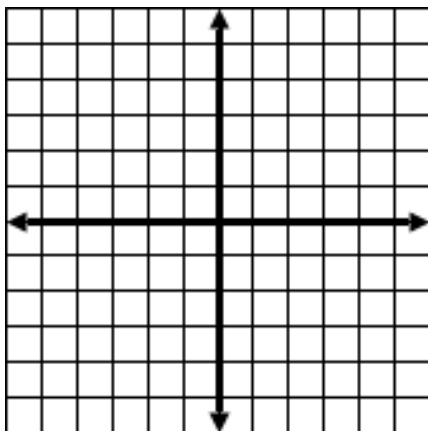
25. $|x + 2| \geq 5$

26. $x^2 - 9x + 8 > 0$

Graph the following inequalities.

27. $y > x^2 - 2$
 $y \leq x + 3$

28. $y \leq x^2(x - 1)(x - 4)$



29. Find the zeros of $f(x) = x^3 + 7x^2 + 10x$.

30. Mrs. Hutschenreuter is hosting a cook-out. She is going to buy McDonald's burgers and fries. If consuming a 2000 calorie diet, the maximum daily requirement is 65 grams of fat and 70 grams of carbohydrates. Use the table to determine which inequalities describe how to obtain the maximum daily requirements.

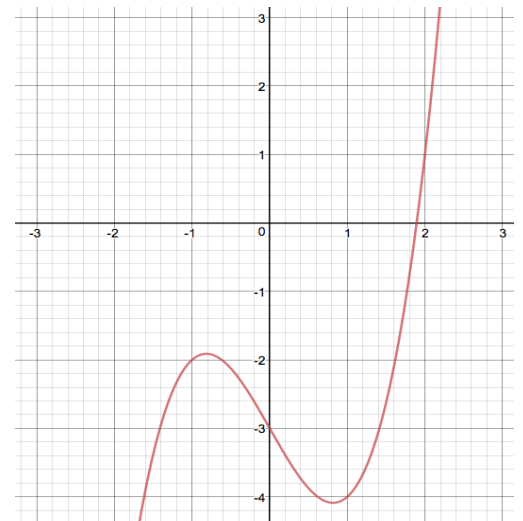
	Fat	Carbs
Hamburger (x)	12 grams	31 grams
Small Fries (y)	11 grams	29 grams

- a. $12x + 31y \leq 65$ b. $12x + 11y \leq 65$ c. $12x + 31y \geq 65$ d. $12x + 11y \geq 65$
 $11x + 29y \leq 70$ $31x + 29y \leq 70$ $11x + 29y \geq 70$ $31x + 29y \geq 70$
 $x \geq 0$ $x \geq 0$ $x \geq 0$ $x \geq 0$
 $y \geq 0$ $y \geq 0$ $y \geq 0$ $y \geq 0$

31. State the domain of the function: $f(x) = \frac{x+2}{x^2-16}$.

32. Which of the following could be a function for the graph to the right?

- a. $y = -x^3 - 3$
b. $y = -x^3 + x + 4$
c. $y = x^3 - 2x - 3$
d. $y = x^3 - 4x + 1$



If $f(x) = x^2 + 3$ and $g(x) = x - 4$, find the following compositions:

33. $[f \circ g](x)$?

34. $(f - g)(x)$

35. $(g \circ f)(5)$

36. Does $y^2 - 4x^2 = 4$ have symmetry to the (a) x-axis, (b) y-axis, (c) $y = x$, and/or (d) the origin?

37. Match the function to the correct transformation?

A. $3f(x)$ S. Shrink/compress Horizontally

J. $f(3x)$ L. Shrink/compress Vertically

B. $\frac{1}{2} f(x)$ K. Stretch Horizontally

E. $f(\frac{1}{2} x)$ M. Stretch Vertically

38. Given $f(x) = x^3 - 5$, find a rule for the inverse.

39. **Multiple Choice:** The graph of $x^2 - y^2 = 9$ is symmetric with respect to:

a) x-axis

b) y-axis

c) neither

d) both axes

40. Simplify $(-2x^2)^3(4x^{-4})$

41. Express $\frac{x^{\frac{4}{5}}}{x^{\frac{1}{5}}}$ using radicals.

42. Approximate to the nearest thousandths.

a) $14 = 7e^k$

b) $9 = 4e^{2x}$

43. Write $3^4 = 81$ in logarithmic form.

44. Write $\log 0.01 = -2$ in exponential form

45. Simplify: $\log_4(3) + \log_4(3) - \frac{1}{2} \log_4(9)$

46. Solve for x; round to the nearest hundredth.

$$2^{2x} = 25$$

47. Solve $\frac{3}{4} \log_8 x = 2 \log_8 2 + \log_8 2$

48. **Matching:**

- A) Exponential Growth
- B) Exponential Decay
- C) Continuous Growth
- D) Growth model
- E) Decay model

- F) $500(1.08)^6$
- G) 5^x
- H) $4e^5$
- I) $(\frac{1}{2})^x$
- J) $500(.76)^4$

49. Find the natural logarithm of 7.

50. Find the common logarithm of 7.

51. Simplify: $\log_5 5^7$