

Rising Precalculus
Summer Assignment

Date _____
Name _____

Directions: Using a pencil and a four function calculator, work each problem by hand. Some problems can only be worked using a graphing calculator. Show all work/ justifications on separate paper. Written work/ justifications should always be neat and legible. Box in your final answer. If all work was completed using a graphing calculator, then write the graphing calculator steps you used. This assignment will be due to your Pre-calculus teacher on the first day of class this Fall.

1. Find and write the equation of best fit for the data in the given table:

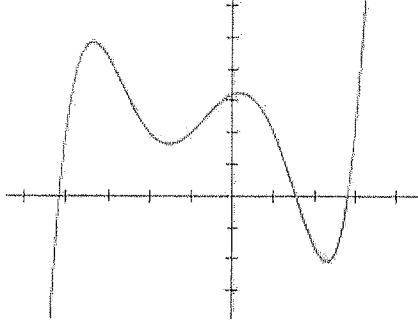
x	0	1	2	3	4	5
y	16	21	28	36	43	49

Be sure to include a sketch of the scatter plot with comments about the form, strength, and direction of the association between the variables as well as the coefficient of determination r^2 value.

2. Solve $\sqrt{2x+5} - 3 = 3$.
3. What are the zeros of the function $f(x) = x^2 - 8x + 4$?
4. You found the solutions of the equation $5x^2 + 21x = -4$ to be -0.2 and -4. What are the zeros of the function $g(x) = 5x^2 + 21x + 4$?
5. What is $\sqrt{32}$ in simplified exponential form?
6. Simplify: $(6 + 3i) - (4 - 2i)$.
7. What is (are) the x-intercept(s) of the graph of $y = \frac{x-4}{x^2+4}$?
8. Find $\sum_{n=1}^{15} (3n - 8)$
9. Simplify: $(5 - 2i)(1 + 3i)$.
10. Write the following exponential equation as an equivalent logarithmic equation: $6^x = 13$?
11. A set of data is distributed with a mean of 105 and a standard deviation of 8. If possible, find the data value corresponding to a z-score of 2. If not, state why.

12. A cellular phone service company charges 20 cents for each minute or part of a minute of airtime. If the total charge y in cents is a function of the number of minutes x that Cora uses her phone, what is the range of this function?
13. Solve $\sqrt{5x - 8} = \sqrt{x^2 - x}$.
14. Simplify $(-64)^{2/3}$.
15. Identify the inside and outside functions for the following composition: $f(g(x)) = (5x^2 + 2)^2$.
16. Solve $\frac{1}{x-1} - \frac{3}{2x+1} = 0$.
17. Solve $\left|\frac{3}{2}x + 2\right| \leq \frac{1}{4}$.
18. Simplify: $\frac{x^2-9}{2x^2+5x-3}$. Be sure to include any restrictions of the variable x .
19. The graph of which function rises without bound as x gets larger and larger?
- A) $f(x) = -2x^2 + x - 3$
B) $f(x) = -\frac{1}{2}x^3 + x^2 - 2x$
C) $f(x) = -3x^4 - 1$
D) $f(x) = \frac{1}{2}x^2 + 3x - 2$
20. Twelve dogs are competing in a dog show. In how many ways can 3 of the dogs place first, second, and third?
21. Describe how the graph of $y = f(x - 3)$ relates to the graph of $y = f(x)$.
22. The graph of which function has an asymptote?
- A) $y = \sqrt{x - 1}$
B) $y = \frac{1}{x^2 - 1}$
C) $y = x^2 - 1$
D) $y = \frac{x^2 - 1}{4}$
23. Use the quadratic formula to solve the equation $4x^2 - 6x + 1 = 0$.

24. The function graphed below is increasing on what interval? Each tick mark represents one unit.



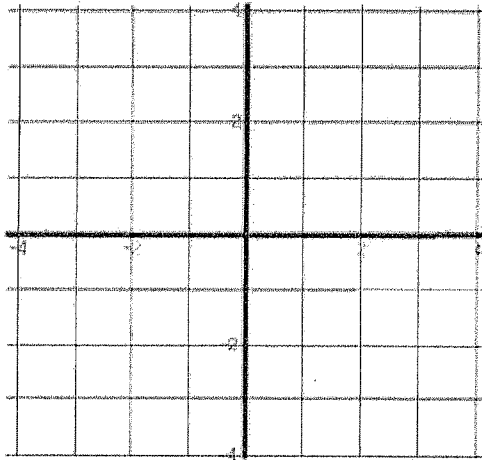
25.

Given the function $y = 1 - \sqrt{4 - x}$

a) state the x-intercept

b) state the y-intercept

c) sketch the function



26. A variable is normally distributed with mean 67 and standard deviation 4. What is the probability that the variable takes on a value between 63 and 71?
27. Variables x and y vary inversely, and $x = 4$ when $y = -3$. What is the value of the constant of proportionality?

28. Solve the following system of equations by graphing, substitution, and elimination:

$$\begin{cases} x^2 - y = 3x \\ 2x + 3y = 6 \end{cases}$$

29. Completely factor $x^3 - x^2 - 4x + 4$.

30. The zeros of a function are 1.5 and -4. Which could be the function?

A) $f(x) = 2x^2 - 5x - 12$

B) $f(x) = 2x^2 - 2x - 12$

C) $f(x) = 2x^2 + 2x - 12$

D) $f(x) = 2x^2 + 5x - 12$

31. Solve $|x + 4| + 1 = 6$.

32. In how many different combinations can 3 raffle tickets be chosen randomly from a hat that contains 20 tickets?

33. What is(are) the y-intercept(s) of the graph of $y = \frac{x^2 + 2x - 3}{x^2 + 4x + 4}$?

34. Write a formula for the nth term of the geometric sequence 1, 3, 9, 27, 81, ...

35. What are the zeros of the function $g(x) = 8x^2 - 2x - 3$?

36. The variable y varies jointly as x and z, and $y = -1$ when $x = 0.25$ and $z = -6$. What is y when $x = 9$ and $z = -2$?

37. You checked the outside temperature every hour over a ten-hour period. Given the table of data, determine the best fit equation to the data.

Hour	0	1	2	3	4	5	6	7	8	9	10
Temperature	40	46	48	51	52	53	53	53	50	49	44

Be sure to include a sketch of the scatter plot with comments about the form, strength, and direction of the association between the variables as well as the coefficient of determination r^2 value.

38. Describe the end behavior of the graph of $y = -x^3 + 2x^2 - 4x + 2$.

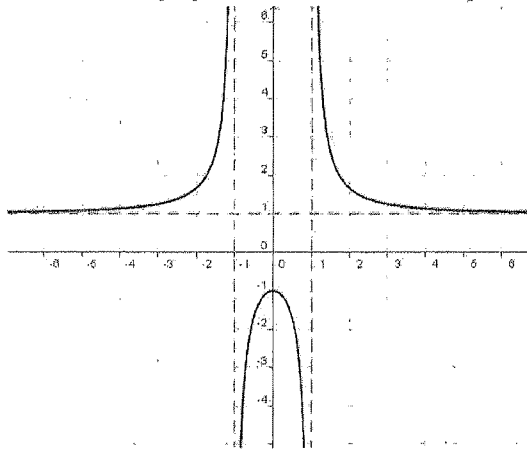
39. Simplify $\sqrt{3x^5} \cdot \sqrt{6x^2}$.

40. State the domain of the function $f(x) = \frac{x^2 - 4}{2x^2 - 5x + 2}$.

41. Find the sum $\sqrt{-20} + \sqrt{-45}$.

42. Find all solutions of the equation $(2x - 1)^2 + 11 = 4$.

43. The function graphed below is decreasing on what interval(s)?



44. Solve $x + \frac{x+1}{x-4} = -1$.

45. Completely factor $16x^3y + 2y^4$.

46. Solve the following system by graphing, substitution, and elimination:

$$\begin{cases} y - x^2 = 2x - 3 \\ x^2 - y = 1 \end{cases}$$

47. What is the inverse of the function $y = 1 - \sqrt{4 - x}$?

48. What is(are) the vertical asymptote(s) of $f(x) = \frac{2x^2 + 7x + 3}{x^2 - 9}$?

49. Simplify $\frac{\frac{x(x^2+x)}{x^2-2x-3}}{\frac{x^2+2x}{x^2-x-6}}$

50. Find $f(g(x))$ if $f(x) = x + 5$ and $g(x) = x^2 - 9$