

Precalculus

Name:

Q1 Cumulative Review – Chapter P, 1 and 2

***Denotes “No Calc” problems*

CHAPTER P

Write the following in interval notation. **

1. x is a positive number

2. $0 < x < 3$

3. $x \leq -6$ or $x > -5$

Solve the following equations for x . **

4. $x(3x + 2) = 20$

6. $6x^2 + 7x - 3 = 0$

5. $4x^2 = 64$

7. $2x^2 - 5x + 1 = 0$

Solve the inequality and sketch the graph on a number line. **

8. $|2x + 1| > 3$

9. $9x^2 \leq 81x$

10. $5x^3 + 14x^2 - 3x \geq 0$

Solve the equations and inequalities using a graphing calculator.

11. $|3x + 7| = x^2 + 2x + 3$

12. $\frac{1}{2}x + 2 = 3x^3 - x$

13. $3 = |-x^2 + 2x + 5|$

14. $x^3 - 2x^2 + x - 4 < -1$

15. $x + 1 \geq -4$

16. $x^2 + 2x - 3 > 5$

State whether the equation is a function. **

17. $y = \sqrt{x-4}$

19. $y = |2x|$

18. $y = 50x + 413$

20. $x^2 + y^2 = 16$

CHAPTER 1

Use the equation $f(x) = x^4 - 3x^3 + x - 1$ to find its properties listed below.

21. Absolute maximum:

25. Increasing intervals:

22. Absolute minimum:

26. Decreasing intervals:

23. Local maximum(s):

27. Constant intervals:

24. Local minimum(s):

28. Even/odd/neither?

Find the domain of the following functions. **

29. $f(x) = x + \sqrt{x-4}$

30. $f(x) = x^2 - 3x + 4$

31. $f(x) = \frac{1}{x\sqrt{4-x^2}}$

Use the equation $f(x) = -3x^2 - 2$. **

32. Is the function bounded/bounded above/bounded below/neither? *Circle one.*

33. Is the function even/odd/neither? *Circle one.*

34. Describe the transformations taking place (in order).

Use the functions to evaluate the following: $f(x) = \sqrt{x^2 - 9}$, $g(x) = 2x + 3$ **

35. $f + g$

36. $f - g$

37. $f(g(x))$

38. $g(f(x))$

39. Confirm the following two functions are inverses of one another: $f(x) = \frac{1}{2}x^3 + 4$, $g(x) = \sqrt[3]{2x - 8}$ **

40. Find the inverse of $f(x) = \sqrt{x - 1} + 4$ and state the domain of $f^{-1}(x)$. **

Use the function $h(x) = -3|x - 2| + 7$

41. List the parent functions and the transformations (in order) taking place. **

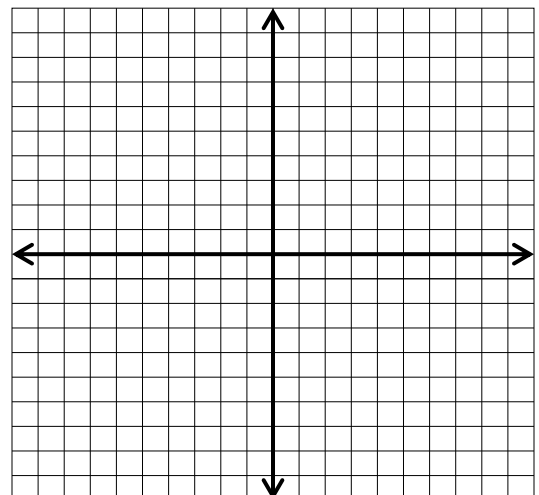
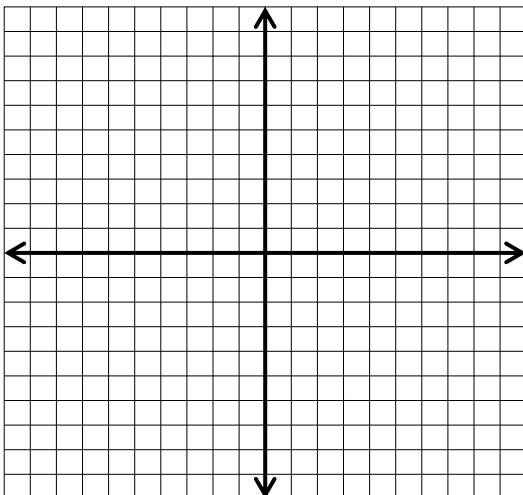
Vertical

Horizontal

42. Graph $h(x)$. Plot at least 4 accurate points. **

43. Graph the following piecewise function:

$$f(x) = \begin{cases} x^2 + 1 & \text{if } x > 0 \\ -2x + 4 & \text{if } x \leq 0 \end{cases} \quad **$$



**** KNOW THE 11 BASIC FUNCTIONS! ****

CHAPTER 2

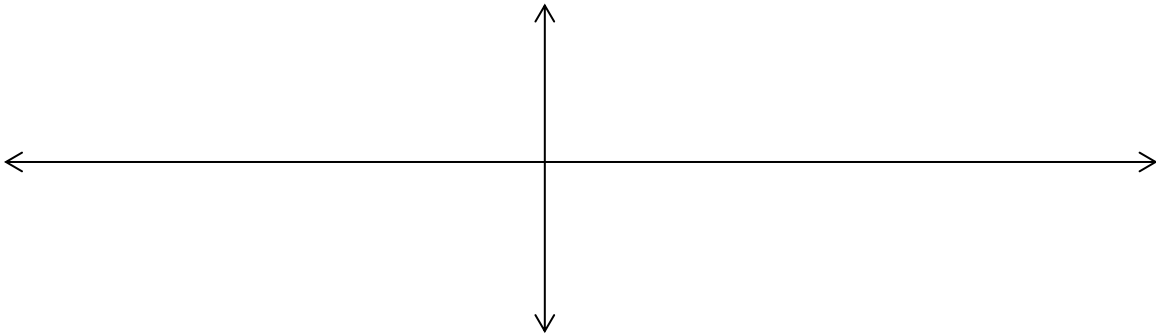
44. Find the vertex and axis of symmetry:

$$y = 3x^2 + 12x - 1$$

45. Convert #44 to vertex form by completing the square.

46. Write an equation of the line passing through $(-2, 7)$ and $(2, -1)$.

47. Sketch a graph of the following polynomial: $f(x) = x(2x - 1)^2(x + 5)^3$. Include zeros (with multiplicity), end behavior and the y-intercept.

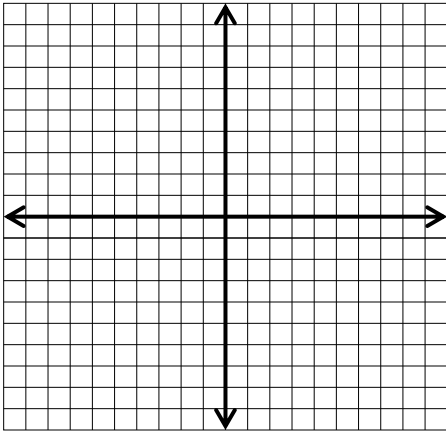


48. Factor completely. Then write a linear factorization of the function (factored form):

$$g(x) = x^5 - 3x^4 - 5x^3 + 5x^2 - 6x + 8$$

49. Write a polynomial of minimum degree in factored form, then in standard form, that has zeros of 4 and $1 + 2i$. **

50. Graph the function. Include any asymptotes (vertical, horizontal, slant), removable discontinuities, x- and y-intercepts, and end behavior. $g(x) = \frac{3x^2 + 13x - 10}{x^2 - 25}$ **



51. Solve for x. Check for extraneous solutions. $\frac{x}{x-2} + \frac{1}{x-4} = \frac{2}{x^2 - 6x + 8}$ **

52. Solve the inequality. Create a sign chart! $\frac{(x-3)|x+4|}{\sqrt{x+1}} > 0$ **

