Pre-Calculus and Trigonometry Prep Problems

Identify the intercepts, domain, range, and asymptotes or holes, if applicable of the following functions. Then sketch a graph of the functions in the space provided.

1. $y = -3x + 5$

   Domain:

   Range:

   Intercepts:

2. $y = \frac{1}{4}x + 2$

   Domain:

   Range:

   Intercepts:

3. $y = 14x + 36$

   Domain:

   Range:

   Intercepts:

4. $y = x^2 + 2x + 1$

   Domain:

   Range:

   Intercepts:

   Vertex:

5. $y = -4x^2 + 24x - 35$

   Domain:

   Range:

   Intercepts:

   Vertex:

6. $y = -x^3 - x^2 + 4x + 4$

   Domain:

   Range:

   Intercepts:

7. $y = -3(x + 8)^3 - 24$

   Domain:

   Range:

   Intercepts:

8. $y = |2x| - 5$

   Domain:

   Range:

   Intercepts:

9. $f(x) = \begin{cases} -x, & x < 0 \\ x, & x \geq 0 \end{cases}$

   Domain:

   Range:

   Intercepts:

10. $f(x) = \begin{cases} 2x, & x < 0 \\ -x + 1, & 0 < x \leq 4 \\ x^2, & x > 4 \end{cases}$

Domain:

Range:

Intercepts:

11. $y = \frac{x^3+x^2-6x}{4x^2+4x-8}$

Domain:

Range:

Intercepts:

Asymptotes:

Holes:

12. $\frac{x^3-16x}{-3x^2+3x+18}$

Domain:

Range:

Intercepts:

Asymptotes:

Holes:

13. $y = \frac{x^2+3x}{x^2-x}$

Domain:

Range:

Intercepts:

Asymptotes:

Holes:

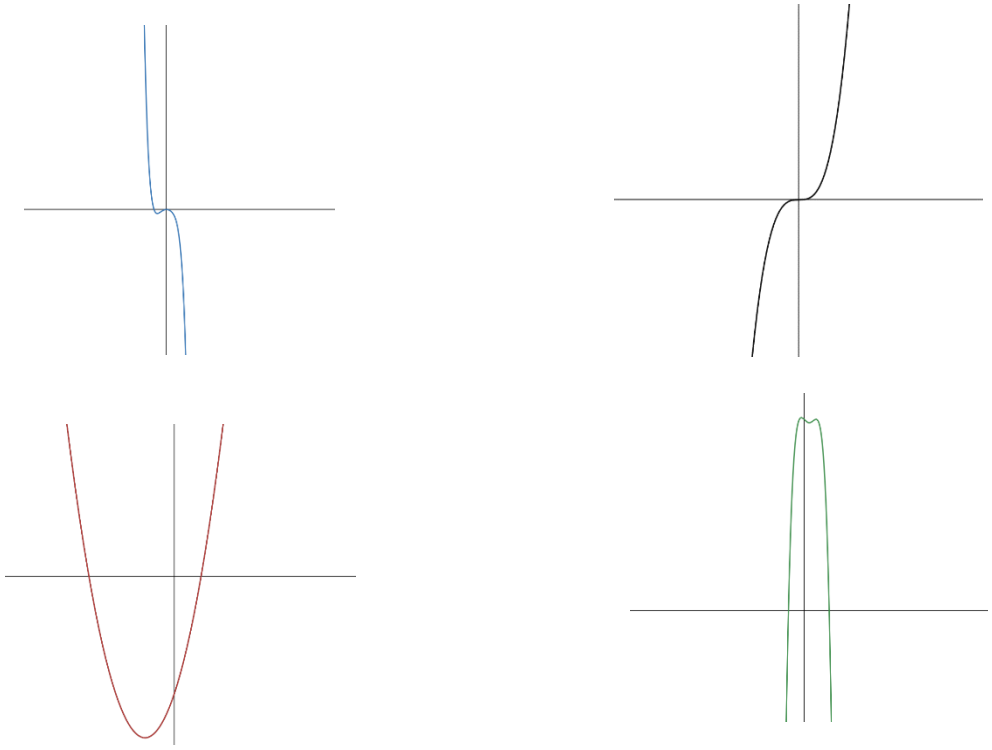
14. Match the following functions to a sketch of their graphs:

A. $y = 4x^3$

B. $y = x^2 + 3x - 6$

C. $y = -x^5 + 4x^4 - x^2$

D. $y = -3x^4 + 4x^3 - x + 15$



Compose the following functions, both as $g \circ f$ and as $f \circ g$:

15. $f(x) = 3x + 1$; $g(x) = x^2 - 6$

16. $f(x) = \sqrt{x - 3} + 4$; $g(x) = \frac{1}{3}x + 12$

Decompose the following functions into a possible *f(x)* and *g(x)*

17. $H(x) = 2x^2 + 8$

18. $H(x) = 3\sqrt{x + 17} - 8$

Using the information provided in the table, find the following:

x	-3	-2	-1	0	1	2	3
$f(x)$	11	9	7	5	3	1	-1
$g(x)$	-8	-3	0	1	0	-3	-8

19. $(f \circ g)(1)$

20. $(f \circ g)(2)$

21. $(g \circ f)(2)$

22. $(g \circ g)(1)$

Find the inverse function of each of the following functions:

23. $f(x) = 5x + 10$

24. $g(x) = x^2 - 6$

25. $h(x) = \frac{\sqrt[3]{x}-1}{3}$

Solve the following systems of equations using either the elimination or the substitution method – be sure to check your work!

26. $-6x - 8y = -28$
    $9x + 5y = -14$

27. $10x + 12y = -26$
    $-6x + 6y = -24$

28. $x + 3y = 18$
$y = -4x + 6$

29. $2x + y = 2$
$3x + 7y = 14$

30. $y = 4x - 9$
$y = x - 3$

31. $18x - 6y = 30$
$-9x - y = -19$

Simplify the following radical expressions:

32. $\sqrt{32}$

33. $\sqrt{128}$

34. $\sqrt{75}$

35. $3^{\frac{1}{2}}$

36. $2^{\frac{4}{3}}$

37. x^{-4}

38. $x^{\frac{-2}{3}}$