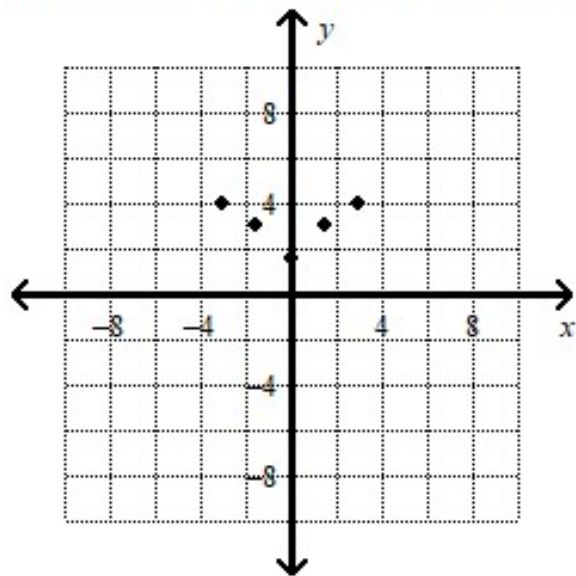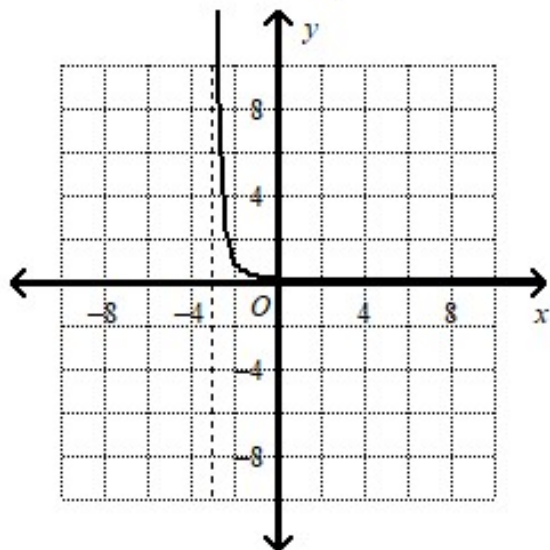Algebra 2 Pre-AP Summer Practice: Complete these problems to the best of your ability. Video tutorial links are provided. Test will be week two of semester. These are pre-requisite skills.
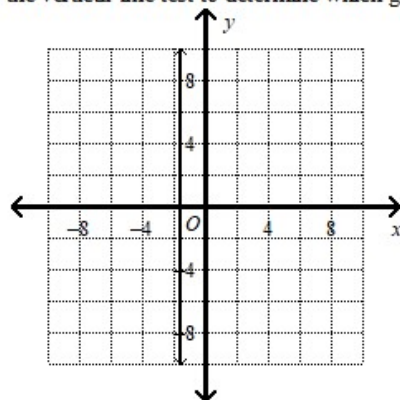
1. Find the domain and range of the relation.

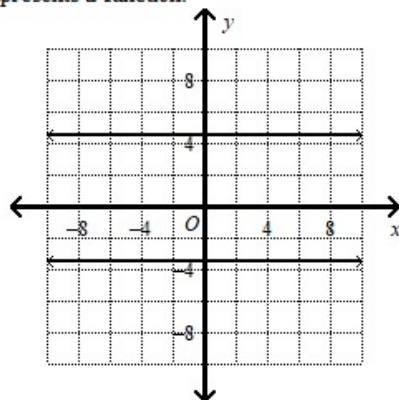2. Find the domain and range of the relation and determine whether it is a function.

3. Use the vertical-line test to determine which graph represents a function.
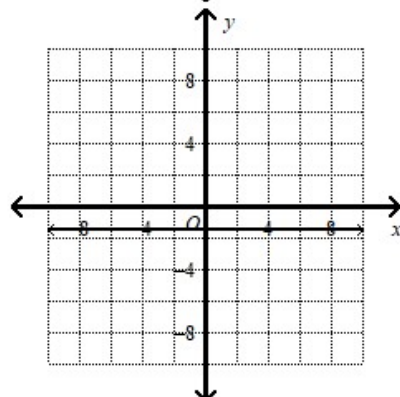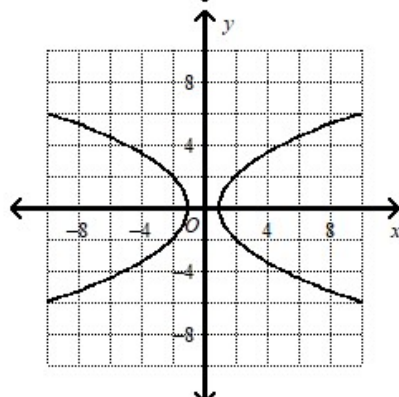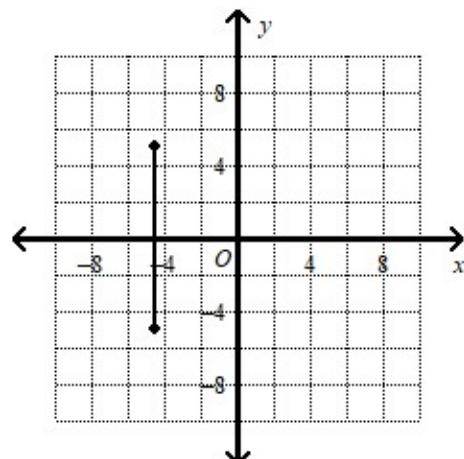
a.

c.

b.

d.

4. Use the vertical-line test to determine which graph represents a function.
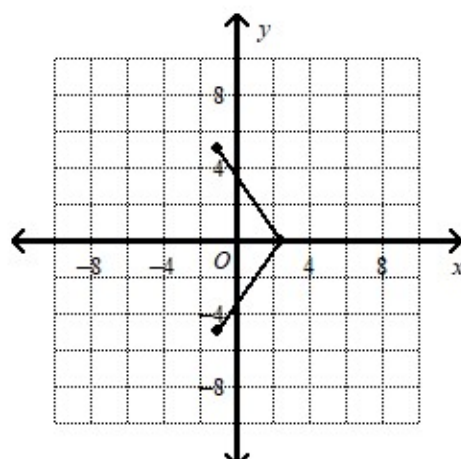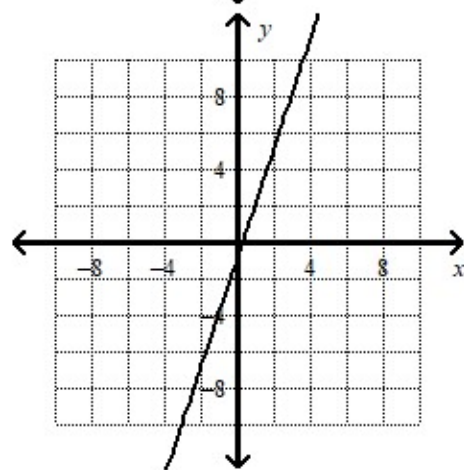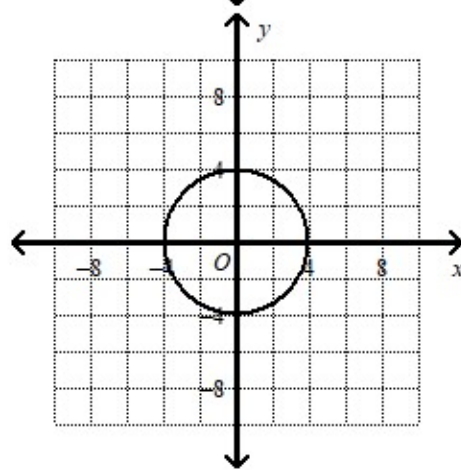
a.

c.

b.

d.

5. Use set notation to write the domain and range of the function $y = 2(x-4)^2 + 3$ shown in the graph.
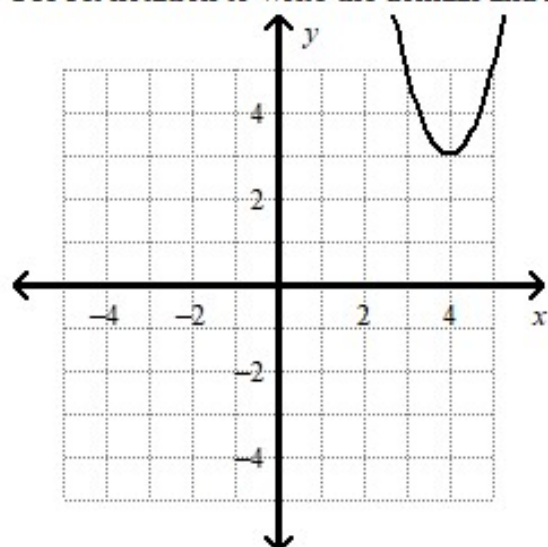
6. Use set notation to write the domain and range of the function $y = -3(x+1)^2 + 3$ shown in the graph.
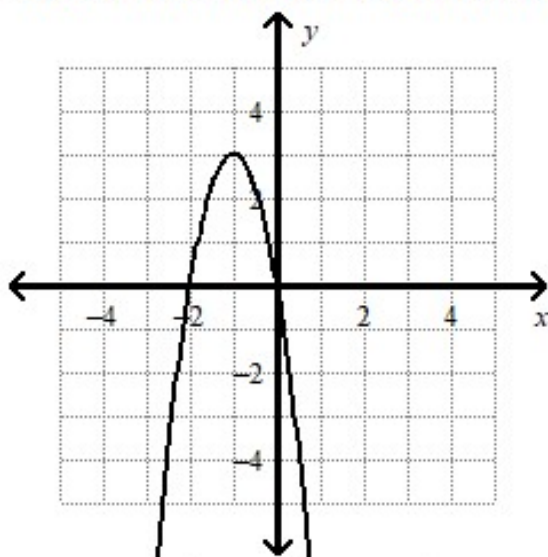
7. Find the domain, range, and intercepts of the function $f(x) = |4x + 2| - 6$.
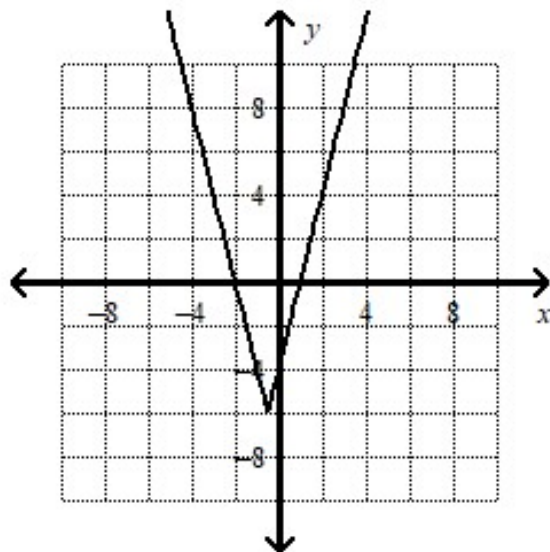
8. Graph the function $f(x) = \sqrt{x + 1}$ and find the maximum and minimum values on the interval $[0, 8]$.

9. A store sells cube-shaped wooden blocks. The cubic parent function $f(x) = x^3$ gives the volume, in cubic centimeters, of a block with edge length x centimeters. Graph the function and find the domain and range that make sense in this context.

Simplify the expression.

10. $\left(6x - 7y - 3z\right) + \left(7z - 3x - 6y\right)$

11. $\left(1 - x + x^2\right) + \left(1 + x - x^2\right) + \left(1 - x^2 + x^5\right)$

12. $\left(2a^5 - 4a + a^4 + 2a^3 + 5\right) + \left(-5a^5 + 3a^3 - 9 + 11a\right)$

13. $\left(x^4 + 5y^3 + 6\right) - \left(3x^4 - 2 + 5xy\right) - \left(-y^3 + 4 + 6xy\right)$

14. $\left(x^2 - 144\right) - \left(x^2 - 24x + 144\right)$

15. $\left(9x^2 + 6y^2 + 3\right) - \left(10x^2 - 6y^2 - 4\right)$

16. $(x+3)\left(3x^3+3x+4\right)$

17. $(8x+y)(x-8y)-(x+8y)(8x-y)$

18. Which expression represents the area of the figure?
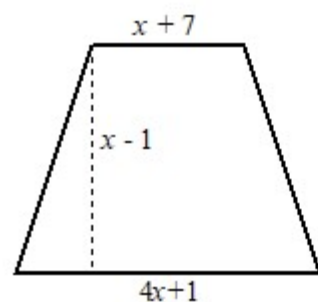
Write the polynomial in factored form.

19. $6x^3-60x^2+144x$

20. x^3+2x^2-15x

Factor the expression.

21. $w^2 + 18w + 77$

22. $d^2 + 10d + 9$

23. $x^2 - x - 42$

24. $r^2 - 49$

25. $49b^2 - 36$

26. $3x^3 + 3x^2 + x + 1$

27. $6g^3 + 8g^2 - 15g - 20$

Factoring Polynomials

https://www.youtube.com/results?search_query=factoring+gcf+and+quadratic+trinomials+khan+academy

Find the sum or difference. Simplify if possible.

28. $\dfrac{4}{12} + \dfrac{9}{12}$

29. $\dfrac{11}{w} - \dfrac{5}{w}$

Simplify.

30. $\dfrac{7}{13} + \dfrac{16}{13} - \dfrac{8}{13}$

31. $\dfrac{1}{4} + \dfrac{5}{6} + \dfrac{3}{8}$

32. $\dfrac{3}{7} - \dfrac{4}{m}$

Find the product. Simplify if possible.

33. $\dfrac{6}{12} \cdot \left(\dfrac{7}{9} \right)$

34. $\dfrac{12y}{13} \cdot \dfrac{11}{24}$

35. $\dfrac{4}{2a} \cdot \dfrac{a}{11}$

Find the quotient. Simplify if possible.

36. $\dfrac{2}{9} \div \left(-\dfrac{3}{27} \right)$

Solve.

37. $w + \dfrac{1}{5} = \dfrac{7}{8}$

Solve the proportion.

38. $\dfrac{10}{a} = \dfrac{15}{30}$

Solve the equation.

39. $2x - 26 = 10$

40. $\dfrac{x}{5} + 9 = 4$

41. $2(x + 4) = 30$

42. $78 = -2(m + 3) + m$

43. $6 = 2(x + 8) - 5x$

44. $\dfrac{5}{4}(a - 8) = \dfrac{2}{3}$

45. $x + 9 = 5(4x - 2)$

46. Solve the volume formula $V = lwh$ for h.

47. Solve the area formula for a circle, $A = \pi r^2$, for r^2.

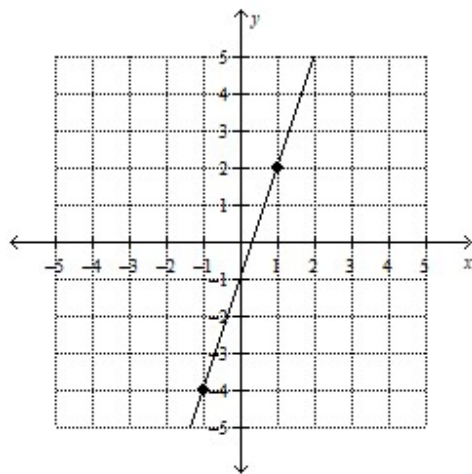48. Solve the area formula for a triangle, $A = \dfrac{1}{2}bh$, for h.

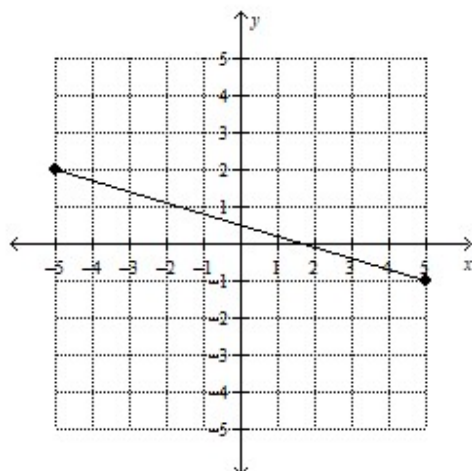**Find the slope of the line that passes through the pair of points.**

49. $(1, 7), (10, 1)$

Write the slope-intercept form of the equation for the line.

50.

51.

52. Write an equation of a line that has the same slope as $2x - 5y = 12$ and the same y-intercept as $4y + 24 = 5x$.

53. The table shows the height of a plant as it grows.
    a. Model the data with an equation.
    b. Based on your model, predict the height of the plant at 12 months.

Time (months)	Plant Height (cm)
3	9
5	15
7	21
9	27

Equations of Lines

https://www.youtube.com/results?search_query=equations+of+lines+in+slope-intercept+form+KHAN+ACADEMY