

For each function, find the vertex and then rewrite the equation in standard form.

1. $a(x) = -2(x+4)^2 + 5$ 2. $b(x) = 3(x-2)^2 + 4$

For each function, rewrite the equation in factored form and then find the zeros.

3. $c(x) = (x+3)^2 - 9$ 4. $d(x) = \left(x + \frac{5}{2}\right)^2 - \frac{9}{4}$

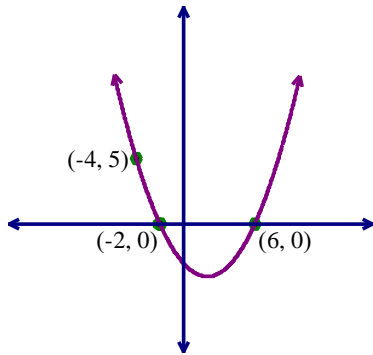
For each function, rewrite the equation in vertex form and then find the vertex.

5. $f(x) = x^2 + 12x + 11$ 6. $g(x) = 2x^2 - 12x + 28$

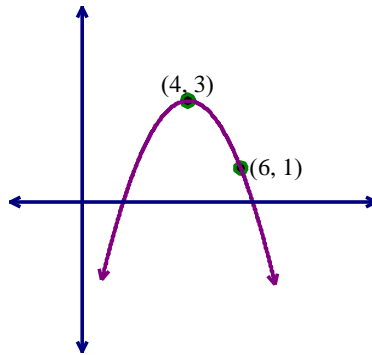
7. Rewrite $h(x) = -2x(x-6)$ in vertex form.

For each graph, write the equation of the function in the given form.

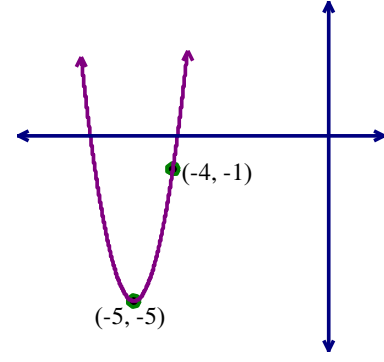
8. Factored form



9. Vertex form



10. Standard form



Sketch a complete graph of each function.

11. $j(x) = -2(x-1)^2 + 8$

12. $k(x) = -3x^2 + 6x$

13. $m(x) = x^2 - 4x + 3$

For each function, find the discriminant and determine the number and type of roots.

14. $n(x) = 2x^2 + 5x + 7$

15. $p(x) = 3x^2 - 12x + 12$

16. $r(x) = \frac{1}{2}x^2 - 6x - 5$

Factor.

17. $2x^4 - 7x^3 - 30x^2$

18. $4x^4 + 13x^3 - 12x^2$

Solve for x .

19. $3x^2 + 20x^2 - 7x = 0$

20. $5x^3 - 28x^2 = 12x$

21. $4x^2 + 4x - 8 = 1$

22. $9x^2 - 11 = 6x$

Rewrite each function in vertex form by completing the square.

23. $f(x) = x^2 - 40x + 9$

24. $g(x) = 6x^2 - 12x - 41$

25. $h(x) = -5x^2 + 40x + 200$

26. $j(x) = x^2 + 9x - 3$

27. $k(x) = -4x^2 - 56x + 3$

28. $m(x) = 3x^2 + 15x + 20$

For each table of values, determine the degree of the polynomial.

29.

x	-2	-1	0	1	2	3
y	22	21	16	7	-6	-23

30.

x	-2	-1	0	1	2	3
y	105	20	9	6	17	120

Simplify.

31. i^4

32. i^3

33. i^{14}

34. $-10(-6+12i)+12(-1+i)$

35. $(5-5i)-(6-6i)$

36. $(3i)(4i)(-2-2i)$

37. $(5+7i)(6-2i)$

38. $(2i)(-5-8i)+(4i)(3i)$

39. $(3+6i)^2$

40. $3(-6+3i)+(4-7i)$

41. $(3i)^2(5i^2)\left(\frac{1}{3}i\right)$

42. $\frac{4+i}{3-i}$

43. $\frac{2-5i}{1+8i}$