

L4.5c Irrational Conjugate Theorem

L4.6 Complex Conjugate Theorem

41. $f(x) = x^3 - 7x^2 + 36$

42. $f(x) = x^3 + x^2 - 22x - 40$

43. $f(x) = x^3 - 10x - 12$

44. $f(x) = x^3 - 16x^2 + 77x - 116$

45. $f(x) = x^4 - 32x^2 + 24x$

46. $f(x) = x^4 + 5x^3 - 33x^2 - 85x$

47. $x = -3, x = 3,$ and $x = 4$; *Sample answer:* graphing; The equation has three real solutions, all which can be found by graphing to find the x -intercepts.

48. no; The number of zeros for a function is always equal to its degree. A cubic function can have three real zeros.

49. 4 cm by 4 cm by 7 cm

50. a. $x^3 - 9x^2 + 27x - 35 = 0$

b. $\pm 1, \pm 5, \pm 7, \pm 35$

c.
$$\begin{array}{r|rrrr} 5 & 1 & -9 & 27 & -35 \\ & & 5 & -20 & 35 \\ \hline & 1 & -4 & 7 & 0 \end{array}$$

Dividing by $(x - 5)$ results in a remainder of 0, so 5 is a solution. The resulting equation, $x^2 - 4x + 7$, has solutions $x = 2 \pm i\sqrt{3}$, so 5 is the only real solution.

d. 2 cm by 2 cm by 2 cm

51. The block is 3 meters high, 21 meters long, and 15 meters wide.

21. $f(x) = x^3 + 4x^2 - 7x - 10$

22. $f(x) = x^3 - 2x^2 - 5x + 6$

23. $f(x) = x^3 - 11x^2 + 41x - 51$

24. $f(x) = x^3 - 12x^2 + 46x - 52$

25. $f(x) = x^3 - 4x^2 - 5x + 20$

26. $f(x) = x^4 - 4x^3 + 14x^2 - 36x + 45$

27. $f(x) = x^5 - 8x^4 + 23x^3 - 32x^2 + 22x - 4$

28. $f(x) = x^5 - 13x^4 + 60x^3 - 82x^2 - 144x + 360$