**SKILLS** Objective A

In 1–14, give a positive real number answer. Do all of the work in your head.

1. $64^{\frac{1}{3}}$  
2. $64^{\frac{1}{6}}$  
3. $10,000^{\frac{1}{4}}$  
4. $(0.04)^{\frac{1}{2}}$  
5. $36^{\frac{1}{2}}$  
6. $625^{\frac{1}{4}}$  
7. $81^{\frac{1}{3}}$  
8. $125^{\frac{1}{3}}$  
9. $\left(\frac{1000}{27}\right)^{\frac{1}{3}}$  
10. $1.44^{\frac{1}{2}}$  
11. $1^{\frac{1}{2}}$  
12. $\left(\frac{16}{121}\right)^{\frac{1}{2}}$  
13. $32^{\frac{1}{5}}$  
14. $343^{\frac{1}{3}}$

In 15–20, estimate to the nearest integer.

15. $52^{\frac{1}{2}}$  
16. $9^{\frac{1}{2}}$  
17. $153^{\frac{1}{4}}$  
18. $300^{\frac{1}{5}}$  
19. $99^{\frac{1}{3}}$  
20. $102^{\frac{1}{3}}$

In 21–26, estimate to the nearest thousandth.

21. $5^{\frac{1}{2}}$  
22. $22^{\frac{1}{3}}$  
23. $10^{\frac{1}{4}}$  
24. $2^{\frac{1}{10}}$  
25. $600^{\frac{1}{6}}$  
26. $(-0.5)^{\frac{1}{3}}$

**SKILLS** Objective D

In 27–34, find all real solutions to the equation. Round to the nearest thousandth when necessary.

27. $u^3 = 14$  
28. $w^2 = 218$  
29. $m^5 + 6 = 9$  
30. $2v^{10} = 24$  
31. $n^6 = \frac{64}{729}$  
32. $3x^4 = 30$  
33. $u^7 - 25 = 45$  
34. $5c^5 + 17 = -3$
PROPERTIES  

Objective E

In 35–40, determine the number of real roots possible.

35. 4th root(s) of 20
36. 5th root(s) of 18
37. 6th root(s) of –12
38. 9th root(s) of –7
39. 6th root(s) of –41
40. 7th root(s) of 68

In 41 and 42, is the given number an 8th root of 390,625? Explain your answer.

41. 5
42. –5

USES  

Objective F

In 43 and 44, recall that the frequencies of notes in the musical scale can be modeled using a geometric sequence with constant ratio $2^{\frac{1}{12}}$.

43. On most pianos, the highest note is the top C with a frequency of 4186.01 Hz. Find the frequency of the F below top C, which is the eighth-highest note on a piano. Round to the nearest tenth.

44. Concert pitch A 440 refers to tuning A above middle C to 440.00 Hz. Find the frequency of B above this A.

45. The volume of a cube is 20 cubic feet.
   a. What is the exact length of an edge of the cube?
   b. What is the length of an edge of the cube to the nearest hundredth?

46. The equation $P_C = P_0(1 - x)^n$ describes the depreciation value of a car over $n$ years, where $P_C$ is the current price of the car, $P_0$ is the original price paid, and $x$ is the yearly depreciation rate. If a car costs $11,453 today and cost $12,000 four months ago, find the yearly depreciation rate.

47. The average price of a gallon of regular gasoline in the United States in 2000 was $1.49. In 2007, it was $2.81. Use the compound interest formula and solve for $r$ to find the average annual increase in the price of a gallon of gasoline.