

Practice 9-3

Finding and Estimating Square Roots

Tell whether each expression is *rational* or *irrational*.

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|-----------------|------------------|--------------------|-------------------|
| 1. $-\sqrt{64}$ | 2. $\sqrt{1600}$ | 3. $\pm\sqrt{160}$ | 4. $\sqrt{144}$ |
| 5. $\sqrt{125}$ | 6. $-\sqrt{340}$ | 7. $\sqrt{1.96}$ | 8. $-\sqrt{0.09}$ |

Between what two consecutive integers is each square root?

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|--------------------|---------------------|----------------------|---------------------|
| 9. $\sqrt{20}$ | 10. $\sqrt{73}$ | 11. $-\sqrt{38}$ | 12. $\sqrt{130}$ |
| 13. $\sqrt{149.3}$ | 14. $-\sqrt{8.7}$ | 15. $\sqrt{213.8}$ | 16. $-\sqrt{320.7}$ |
| 17. $\sqrt{113.9}$ | 18. $-\sqrt{840.6}$ | 19. $-\sqrt{1348.9}$ | 20. $\sqrt{928.2}$ |

Find the square root(s) of each number.

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|----------|---------------------|--------------------|----------|
| 21. 49 | 22. 2.25 | 23. $\frac{1}{16}$ | 24. 400 |
| 25. 6.25 | 26. $\frac{36}{25}$ | 27. 196 | 28. 2.56 |

Simplify each expression.

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|-------------------|-------------------------------|-------------------|--------------------------------|
| 29. $\sqrt{0.25}$ | 30. $\pm\sqrt{\frac{9}{100}}$ | 31. $\sqrt{576}$ | 32. $\pm\sqrt{\frac{121}{36}}$ |
| 33. $\sqrt{1600}$ | 34. $-\sqrt{0.04}$ | 35. $\sqrt{2500}$ | 36. $\sqrt{4.41}$ |

Find the value of each expression. If necessary, round to the nearest hundredth.

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|--------------------|---------------------|----------------------------|--------------------|
| 37. $\sqrt{49}$ | 38. $\sqrt{196}$ | 39. $-\sqrt{\frac{9}{25}}$ | 40. $\sqrt{1.44}$ |
| 41. $-\sqrt{1225}$ | 42. $-\sqrt{173.2}$ | 43. $\sqrt{1123.7}$ | 44. $\sqrt{216.9}$ |

Solve the following problems. Round to the nearest tenth if necessary.

45. You are to put a metal brace inside a square shipping container. The formula $d = \sqrt{2x^2}$ gives the length of the metal brace, where x is the length of the side of the container. Find the length of the brace for each container side length.
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|---------------|-----------------|---------------|---------------|
| a. $x = 3$ ft | b. $x = 4.5$ ft | c. $x = 5$ ft | d. $x = 8$ ft |
|---------------|-----------------|---------------|---------------|
46. You are designing a cone-shaped storage container. Use the formula $r = \sqrt{\frac{3V}{\pi h}}$ to find the radius of the storage container. Find the radius when $V = 10,000$ ft³ and $h = 10$ ft.

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