

**Practice  
1-5****Problem Solving**

1. If  $x = 36$  and  $y = 25$ , is  $\sqrt{x + y}$  rational or irrational? Simplify your answer.
  
  
  
  
  
  
  
  
  
  
2. After an accident, police can use the formula  $v = 2\sqrt{5L}$  to estimate the speed,  $v$ , in miles per hour, that a car was traveling by measuring the length of the skid marks,  $L$ , in feet.
  - a) Estimate the speed of a car that left skid marks 65 ft long. Round to the nearest tenth as needed.
  
  
  
  
  
  
  
  
  
  
  - b) If the posted speed limit is 40 mi/h, was the car speeding?
  
  
  
  
  
  
  
  
  
  
3. Write  $0.\overline{87}$  as a fraction in simplest form.
  
  
  
  
  
  
  
  
  
  
4. Is  $\sqrt{x^2 + y^2}$  rational or irrational when  $x = 14$  and  $y = 8$ ? If you pick a whole number value for  $x$ , can you always find a whole number value for  $y$  to make the expression a rational number? Explain.

5. A couple wants to enclose a square garden with area  $141 \text{ ft}^2$ . The wife says that they need about  $47.6 \text{ ft}$  of fence. The husband disagrees. He says they need about  $11.9 \text{ ft}$  of fence.
- a) Who is correct?
- b) What error did the person who found the incorrect length make?
- A. The person divided the area of the garden by 4 to find the side length.
  - B. The person added 4 to the side length instead of multiplying by 4 to find the perimeter.
  - C. The person squared the area instead of finding the square root to find the side length.
  - D. The person found the side length of the garden, not the perimeter.
- c) Explain how you found the correct length of fence that the couple needs.

6. A woman wants to send a framed photograph of her family to her parents. The frame is  $10 \text{ in.}$  long and  $6 \text{ in.}$  wide. Will the frame lay flat in a box that has a square base, height  $6 \text{ in.}$ , and volume  $564 \text{ in.}^3$ ? Round to the nearest tenth as needed.

7. a) Is  $\sqrt{y + x + z}$  rational or irrational for  $x = 15$ ,  $y = 22$ , and  $z = 14$ ? Simplify your answer.

- b) Is  $\sqrt{y + x + z}$  rational or irrational for  $x = 14$ ,  $y = 25$ , and  $z = 10$ ? Simplify your answer.

- c) Find three different values that make the expression rational.
- d) Find three different values that make the expression irrational.
- e) Describe how you found these sets of numbers.
8. Write  $1.\overline{48}$  as a mixed number in simplest form.
9. If  $x = 4$  and  $y = 5$ , is  $\sqrt{x^2 + y^2 + 57}$  rational or irrational? Simplify your answer.
10. a) **Challenge** If  $x = 5$ ,  $y = 6$ , and  $z = 2$ , is  $\sqrt{x^2 + y^2 + z^2 + 56}$  rational or irrational? Simplify your answer.
- b) If the result is an irrational number, find values for  $x$ ,  $y$ , and  $z$  that give a rational number.

c) Once you've found three values that give a rational number, find three other values for  $x$ ,  $y$ , and  $z$  that give a rational number.

**11. Challenge** A toy has various shaped objects that a child is supposed to push through matching holes. The area of the square hole is  $5 \text{ cm}^2$ . The area of the circular face of the round peg is  $5 \text{ cm}^2$ . Will the round peg fit through the square hole? Use  $\pi = 3.14$ . Round to the nearest hundredth as needed.