

3.3 Estimating Square Roots

Pg 99-100

Q# 4, 5, 8-10, 14, 15, 19, 21

Check Your Understanding

Practise

For help with #4 to #5, refer to Example 1 on page 96.

4. Estimate the square root of each number, to one decimal place. Check with a calculator.

a) 72 b) 103 c) 55

5. Estimate each value, to one decimal place. Check your answer with a calculator.

a) $\sqrt{14}$ b) $\sqrt{86}$ c) $\sqrt{136}$

For help with #6 to #9, refer to Example 2 on page 97.

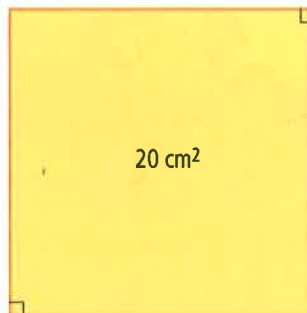
6. What is an example of a whole number that has a square root between 9 and 10?
7. Identify a whole number with a square root between 11 and 12.
8. Identify all possible whole numbers with a square root larger than 2 and smaller than 3.
9. What are all possible whole numbers that have a square root between 4 and 5?

Apply

10. Kai uses an entire can of paint on a square backdrop for the school play. The label on the can states that one can covers 27 m^2 of wall surface. Estimate the backdrop's side length, to one decimal place.

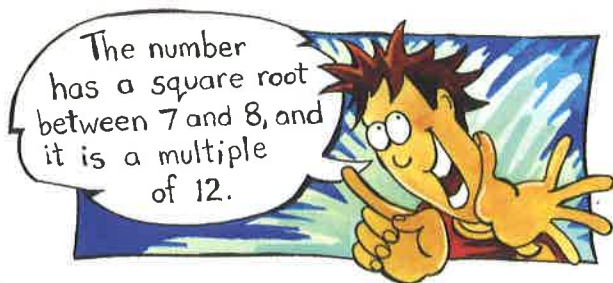


11. The square has an area of 20 cm^2 .



- a) Use perfect squares to estimate the side length to one decimal place.
- b) Check your answer using a ruler to measure the side of the square. Measure to the nearest tenth of a centimetre.
12. While shopping online, Ji Hun finds a square rug with an area of 11 m^2 . He needs to know if it will fit in his $4 \text{ m} \times 5 \text{ m}$ bedroom.
- a) Estimate the side length of the rug, to one decimal place.
- b) Check your estimate with a calculator.
- c) Will the rug fit? Explain.
13. Stella is planning an outdoor wedding. She would like a square dance floor with an area of 115 m^2 .
- a) Determine the side length of the dance floor, to the nearest tenth of a metre.
- b) Stella finds out that the dance floor will be made up of floorboards that each measure 1 m^2 . What are the two side lengths the dance floor can have that are closest to what she wants?
- c) What are the two square areas for the dance floor that Stella can choose from?
- d) Which area will Stella choose? Explain.

14. Alex is thinking of a number.



- a) What number could he be thinking of?
b) Is there more than one answer? Explain.
15. Order the following numbers from least to greatest: 7, $\sqrt{46}$, 5.8, $\sqrt{27}$, 6.3.
16. A fitness centre will install a square hot tub in a $6\text{ m} \times 6\text{ m}$ room. They want the tub to fill no more than 75% of the room's area.
- a) What is the maximum area of the hot tub?
b) What dimensions, to a tenth of a metre, will the fitness centre order from the manufacturer? Explain.

17. Carmel wants to mount an $18\text{ cm} \times 18\text{ cm}$ square picture on a square board that is four times the area of the picture.

- a) What is the area of the picture?
b) What is the area of the board?
c) What are the dimensions of the board?

Extend

18. a) Evaluate $\sqrt{9}$.
b) Estimate the square root of your answer in part a), to one decimal place.
c) Use a calculator to check your estimate. Express your answer to the nearest hundredth.
d) How close is your estimate in part b) to your calculation in part c)?
19. Estimate $\sqrt{160\ 100}$. Explain how you determined your estimate.
20. What is the smallest natural number value for n if the solution for $\sqrt{56n}$ is also a natural number?
21. Determine two numbers that have a square root between 326 and 327, are divisible by 100, and are a multiple of 6.

MATH LINK

You have created a mini peg board game called Mind Buster. The square game board has a base area of 134 cm^2 . You go to the store to get a box for storing the game. You find five boxes with the base dimensions shown.

- a) Identify which boxes can store the game board. Explain.
b) Which box would you choose? Why?

