

Section 1.1 Square Roots and Perfect Squares

Review: How to change a decimal to a fraction.

↳ Always look at the last number and that's the decimal position we are looking for!

Example 1 Write as a fraction in lowest terms.

a) 0.6

b) 0.08

c) 0.25

d) 0.379

Remember:

$$0.1 = \frac{1}{10} \text{ (tenth)}$$

$$0.01 = \frac{1}{100} \text{ (hundredth)}$$

$$0.001 = \frac{1}{1000} \text{ (thousandth)}$$

Note: Some fractions and decimals can also be perfect squares.

One of the numbers in Example 1 is a perfect square. Can you tell which one? Explain your choice.

A fraction or decimal is a perfect square if the area can be represented using squares.

Example 2 Is $\frac{4}{9}$ a perfect square?

Let's represent the fraction using a diagram.

Another way to determine if a fraction is a perfect square is to find out if the **numerator** (top number) and the **denominator** (bottom number) are both perfect squares.

Example 3

a) Using a diagram, determine the value of $\sqrt{\frac{9}{25}}$.

b) Is $\frac{9}{25}$ a perfect square? How do you know?

c) What's another way we could have found the value of $\sqrt{\frac{9}{25}}$?

Example 4 Determine whether each number is a perfect square.

a) 0.36

b) 1.44

c) $16\frac{4}{9}$

d) $4\frac{21}{25}$

e) $\frac{8}{50}$

Example 5

a) Which decimal is a perfect square 6.4 or 0.64? Justify your answer.

b) Determine the value of $\sqrt{6.4}$ and $\sqrt{0.64}$ on a calculator. How can this help determine which number is a perfect square?

A calculator can be used to help determine if a decimal is a perfect square.

There are 3 types of decimals to consider:

- terminating decimal
- repeating decimal
- nonterminating and nonrepeating decimal

Example 6

Using a calculator, determine which decimals are a perfect square.

a) 1.4

b) 0.16

c) $\frac{1}{9}$

A number is a perfect square if its square root produces a terminating or repeating decimal.

List of some Perfect Squares of Decimals Numbers

$$0.1^2 = 0.1 \times 0.1$$

$$0.2^2 = 0.2 \times 0.2$$

$$0.3^2 = 0.3 \times 0.3$$

$$0.4^2 =$$

$$0.5^2 =$$

$$0.6^2 =$$

$$0.7^2 =$$

$$0.8^2 =$$

$$0.9^2 =$$

$$1.1^2 =$$

$$1.2^2 =$$

$$1.3^2 =$$

$$1.4^2 =$$

$$1.5^2 =$$

$$1.6^2 =$$

$$1.7^2 =$$

$$1.8^2 =$$

$$1.9^2 =$$

Example 7 Calculate the number whose square root is...

a) 5

b) 0.5

c) 1.21

d) $\frac{17}{5}$

Example 8 Complete the table.

Decimal	Value of Square Root	Type of Decimal	Is decimal a perfect square?
1.69			
3.5			
70.5			
5.76			
0.25			
2.5			

Work Book Questions

p.11-12 #3ab, 5aceg, 7acegi, 8adgkl, 9aceg, 11a (i)(ii)(iii)(iv)(v)(vi), 14ab, 16

Extra Practice Questions

p.11-12 #3c, 5bdfh, 7bdfhi, 8bcefhi, 9bdfh