

Lesson 9-2

Example 1 Classify Real Numbers

Name all of the sets of numbers to which each real number belongs.

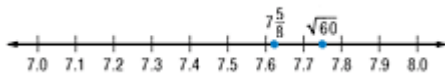
- a. $\frac{42}{14}$ Since $\frac{42}{14} = 3$, this number is an integer and a rational number.
- b. $-\sqrt{133}$ $-\sqrt{133} = -11.53256259\dots$ It is not the square root of a perfect square so it is irrational.
- c. 5 This number is a natural number, a whole number, an integer, and a rational number.
- d. $0.\bar{8}$ This repeating decimal is a rational number because it is equivalent to $\frac{8}{9}$. $8 \div 9 = 0.88888\dots$
- e. $\sqrt{81}$ Because $\sqrt{81} = 9$, this number is an integer and a rational number.

Example 2 Compare Real Numbers

- a. Replace \bullet with $<$, $>$, or $=$ to make $7\frac{5}{8} \bullet \sqrt{60}$ a true statement.

Express each number as a decimal. Then graph the numbers.

$$7\frac{5}{8} = 7.625 \text{ and } \sqrt{60} = 7.745966692\dots$$

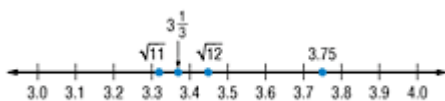


Since $7\frac{5}{8}$ is to the left of $\sqrt{60}$, $7\frac{5}{8} < \sqrt{60}$.

- b. Order $\sqrt{12}$, $3\frac{1}{3}$, 3.75, and $\sqrt{11}$ from least to greatest.

Express each number as a decimal. Then compare the decimals.

$$\begin{array}{ll} \sqrt{12} = 3.464101615\dots & 3\frac{1}{3} = 3.3333333\dots \\ 3.75 = 3.75 & \sqrt{11} = 3.31662479\dots \end{array}$$



From least to greatest, the order is $\sqrt{11}$, $3\frac{1}{3}$, $\sqrt{12}$, 3.75.

Example 3 Solve Equations

Solve each equation. Round to the nearest tenth, if necessary.

a. $x^2 = 100$

$$x^2 = 100$$

$$\sqrt{x^2} = \sqrt{100}$$

$$x = \sqrt{100} \text{ or } x = -\sqrt{100}$$

$$x = 10 \text{ or } x = -10$$

The solutions are 10 and -10 .

Write the equation.

Take the square root of each side.

Find the positive and negative square root.

b. $b^2 = 42$

$$b^2 = 42$$

$$\sqrt{b^2} = \sqrt{42}$$

$$b = \sqrt{42} \text{ or } b = -\sqrt{42}$$

$$b \approx 6.5 \text{ or } b \approx -6.5$$

The solutions are 6.5 and -6.5 .

Write the equation.

Take the square root of each side.

Find the positive and negative square root.

Use a calculator.