Write each number in $\frac{m}{n}$ form where m and n are integers with $n \neq 0$. Simplify your answers.

1. 20.75 $\frac{83}{4}$
2. -0.48 $\frac{-12}{25}$
3. $4\frac{6}{13}$ $\frac{58}{13}$
4. $-\frac{39}{56}$ $\frac{-39}{56}$
5. 1.34 $\frac{67}{50}$
6. 60% $\frac{3}{5}$

For each pair of numbers, find the absolute value of each number. Then, determine which number is farther from 0 on the number line.

7. -16 and -18 16; 18; -18
8. $-\frac{15}{4}$ and $\frac{18}{7}$ $\frac{15}{4}$; $\frac{18}{7}$; $-\frac{15}{4}$
9. 2.36 and -2.7 2.36; 2.7; -2.7
10. $\frac{31}{3}$ and $\frac{40}{6}$ $\frac{31}{3}$; $\frac{40}{6}$; $\frac{31}{3}$

Using long division, write each rational number as a decimal. Use the bar notation if the rational number is a repeating decimal.

11. $\frac{7}{56}$ 0.125
12. $9\frac{13}{20}$ 9.65
13. $\frac{100}{11}$ $9.\overline{09}$
14. $-\frac{5}{12}$ $-0.41\overline{6}$
15. $-2\frac{9}{55}$ $-2.1\overline{63}$
16. 47% 0.47

Use the irrational numbers below for questions 17 to 20.

$\sqrt{31}$, $-\sqrt{112}$, $\sqrt[3]{142}$, $-\frac{1}{4}\pi^3$

17. Using rational numbers, find a segment with a distance of not more than 0.1 to locate each irrational number approximately on the real number line. See

18. Write a rational approximation of each irrational number correct to 2 decimal places. See margin.

19. Graph on a real number line the interval and the approximate location of each irrational number. See margin.

20. Order the irrational numbers from greatest to least using the symbol >.

$$\sqrt{31} > \sqrt[3]{142} > -\frac{1}{4}\pi^3 > -\sqrt{112}$$

Use the real numbers below for questions 21 to 24.

$-12\frac{3}{8}, \frac{90}{7}, -\sqrt{49}, \sqrt{164}, -8.207$

21 Find the absolute value of each real number in decimal form, correct to three decimal places. 12.375; 12.857; 7.000; 12.806; 8.207

22 Graph each real number on a real number line. See margin.

23 Order the numbers from least to greatest using the symbol <. See margin.

24 *Math Journal* Explain why the product of a nonzero rational number and an irrational number is irrational. See margin.

23 $-12\frac{3}{8} < -8.207 < -\sqrt{49} < \sqrt{164} < \frac{90}{7}$

24 Since an irrational number is a nonterminating and nonrepeating decimal, when a rational number is multiplied by the irrational number, the product will also be nonterminating and nonrepeating. For example, 1.23456… is an irrational number with an infinite and nonrepeating pattern of digits after the decimal point. If n is a rational number, then $1.23456\ldots \cdot n = (1 \cdot n) + (0.2 \cdot n) + (0.03 \cdot n) + (0.004 \cdot n) + (0.0005 \cdot n) + (0.00006 \cdot n)$, and so on. So, the product is also an irrational number.

Solve.

25 Round each number to the given number of significant digits.

Number	Number of Significant Digits	Answer
0.1350	2	?
3,004	3	?
22.5	1	?
9.03	2	?
4,567	3	?
507.01	4	?
9,820.036	5	?
6.999	3	?

0.14
3,000
20
9.0
4,570
507.0
9,820.0
7.00

26 The distance between New York City, New York, and Sydney, Australia, is about 15,989 kilometers. What is this distance when rounded to 2 significant digits? 16,000 km

27 A dime has a mass of 2.268 grams. Round the mass of the dime to 3 significant digits. 2.27 g

28 In 2009, the population of New York City was estimated at 8,391,881. Round this population estimation to the given number of significant digits.

a) 2 significant digits 8,400,000

b) 3 significant digits 8,390,000

c) 4 significant digits 8,392,000

29 A square has an area of 72 square inches. What is the length of a side of the square correct to 2 significant digits? 8.5 in.