Algebra II

6-6

Rational and Irrational Numbers

Number Sets

$\mathbb{N}$ Natural # - $\{1,2,3\ldots\}$

Whole - $\{0,1,2,3\ldots\}$

$\mathbb{Z}$ Integers - $\{\ldots -2,-1,0,1,2,\ldots\}$

$\mathbb{Q}$ Rational - Any number that can be written as a fraction

Irrational - Non-repeating Non-terminating decimal

$\mathbb{R}$ Real numbers - all the above

Classify each real number or expression as either rational or irrational.

1a) $\sqrt{49} = 7$

$\mathbb{Q}$

b) $\sqrt{50} = 5\sqrt{2}$

Irrational

5a) 1.23

$\mathbb{Q}$

b) $1.\overline{23}$

$\mathbb{Q}$

c) 1.2345678910111213...

Irrational

Write each fraction as a terminating or repeating decimal.

7) $\frac{5}{8} = 0.625$

Write each decimal as a common fraction in lowest terms.

11) $5.06 = 5\frac{6}{100}$

$= 5\frac{3}{50}$

$= \frac{253}{50}$

Write each decimal as a common fraction in lowest terms.

19) $2.\overline{36}$

$100x = 236.\overline{36}$

$-\quad x = 2.\overline{36}$

$99x = 234$

$x = \frac{234}{99} = \boxed{\frac{26}{11}}$

1) set the number = x

2) Multiply by the place value under the bar

2.3636363636

3) Subtract these.

4) Solve for x

Find a rational and an irrational number between each given pair.

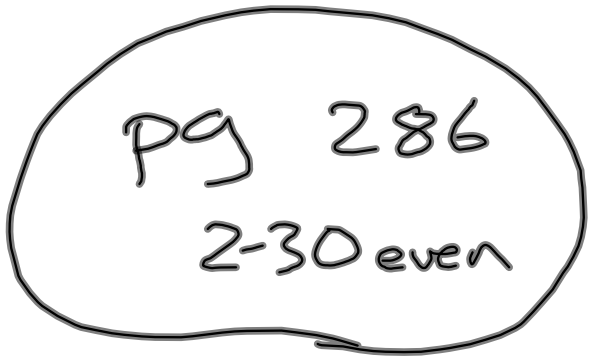
23) 0.1 and 0.2

a) 0.15

b) 0.123456789101112...

or

0.1011011101111011111011111110....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