7.4 Approximating Square Roots p. 310

Real Numbers - any number found in the real world

- There are 2 main groups

Rational

- ~~any # you can write as a fraction~~
  ex: $-\frac{1}{2}$, $\frac{2}{3}$, 2.25, $0.\overline{3}$, $-1.2\overline{4}$
- integers (any + or - whole)
  ex: -1, 4, -8, 300
- whole numbers (+ only)
  ex: positive integers plus 0
- Natural numbers
  ex: 1, 2, 3, etc (+ only)
  (not including 0)

Irrational

π ; 2π

any nonperfect square root
ex: $\sqrt{7}$ $\sqrt{2}$

any non perfect cube root
ex: $\sqrt[3]{12}$ $\sqrt[3]{-19}$

Classify each number:

- Irrational
- Rational → Integer → Whole → Natural

a) $\sqrt{12}$ → irrational
b) $-0.\overline{25}$ → rational
c) $-\sqrt{9}$ → rational, integer
d) $\frac{72}{4}$ → rational, integer, whole, natural
e) π → irrational
f) 0.121221222... → irrational
g) $-\sqrt{196}$ → rational, integer
h) $\sqrt[3]{2}$ → irrational
i) 0.35 → rational

Approximating a square root:
• estimate to the nearest (a) integer and (b) tenth

1) $\sqrt{8}$ a) 3 b) 2.8

2) $-\sqrt{13}$ a) -4 b) -3.6

3) $-\sqrt{24}$ a) -5 b) -4.9

4) $\sqrt{110}$ a) 10 b) 10.5

5) $\sqrt{23}$ a) 5 b) 4.8

6) $\sqrt{71}$ a) 8 b) 8.4

Comparing Real Numbers: use $<$ or $>$

1) $\sqrt{5} < 2\frac{2}{3}$

2) $\sqrt{0.49} < 0.71$

3) $\sqrt{23} > 4\frac{1}{5}$

4) $\sqrt{10} > -\sqrt{5}$

5) $-\sqrt{2} > -2$

6) $\sqrt{38} < \sqrt{\frac{100}{3}}$