4.2 Irrational Numbers

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9:03 AM

Rational Number

↳ has a decimal that terminates or repeats
↳ radicals that are $\sqrt{}$ or $\sqrt[3]{}$ of perfect squares
↳ any # that can be written in the form $\frac{m}{n}$, where $n \neq 0$ and m & n are integers (set of #'s ex. -3, -2, -1, 0, 1, 2, 3...etc.)

Irrational Number

↳ can't be in the form $\frac{m}{n}$, where m & n are integers, $n \neq 0$
↳ the decimal neither terminates nor repeats

ex. $\sqrt{2} = 1.414213562...$
$\sqrt[3]{-50} = -3.68403499...$

Ex. #1

Rational or Irrational

(a.) $-\frac{3}{5} = -0.6$ ← decimal terminates ∴ Rational

(b.) $\sqrt{14} = 3.741...$ ← decimal neither repeats nor terminates ∴ Irrational

(c.) $\sqrt[3]{\frac{8}{27}} = \frac{2}{3} = 0.\overline{6}$ ← perfect cube + repeating decimal ∴ Rational

Square Root of a Number:

$\sqrt{4} = 2 \times 2$ multiplying 2 #'s together $= \boxed{2}$

$\sqrt{16} = 4 \times 4$ multiplying 2 #'s together $= \boxed{4}$

Cube Root of a Number:

$\sqrt[3]{27} = 3 \times 3 \times 3$ multiplying 3 #'s together $= \boxed{3}$

Ex. #2 Solve

(a.) $\sqrt[4]{16} = 2 \times 2 \times 2 \times 2$

multiplying 4 #'s together

$= \boxed{2}$

(b.) $\sqrt[5]{32} = 2 \times 2 \times 2 \times 2 \times 2$

multiplying 5 #'s together

$= \boxed{2}$

Please do pg. 211 # 3-6, 9-11