WWK PAGE 8

IRRATIONAL NUMBERS: SET OF #'S WHOSE DECIMAL REPRESENTATIONS ARE NEITHER TERMINATING OR REPEATING

$\pi, -\sqrt{3}, \sqrt{5}$

Aug 30-10:12 AM

TOC 26 IRRATIONAL NUMBERS

$\sqrt[3]{8}$ — radical sign, radicand

If no #, than automatically it means a 2 is there

SIMPLIFY

$\sqrt{75}$

$\sqrt{3 \cdot 25}$

$\sqrt{5 \cdot 5}$

$5\sqrt{3}$

* Prime factorization (for every pair, that one common # goes on the outside of the radical sign, everything else stays under the radical sign)

ADDING/ SUBTRACTING

* Simplify each radical
* add only the coefficients with like radicands.

$7\sqrt{2} + 5\sqrt{2} = (7+5)\sqrt{2} = \boxed{12\sqrt{2}}$

$3\sqrt{5} + 5\sqrt{3} = \boxed{3\sqrt{5}+5\sqrt{3}}$

MUULTIPLYING

$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$ or $\sqrt{a} \cdot \sqrt{b} = \sqrt{ab}$

ex: $\sqrt{2}\sqrt{5} = \sqrt{2 \cdot 5} = \sqrt{10}$

$\sqrt{7}\sqrt{7} = \sqrt{49} = 7$

DIVIDING

$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$ or $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

$b \neq 0$

ex: $\frac{\sqrt{75}}{\sqrt{3}} = \sqrt{\frac{75}{3}} = \sqrt{25} = \boxed{5}$

$\frac{\sqrt{90}}{\sqrt{2}} = \sqrt{\frac{90}{2}} = \sqrt{45} = \boxed{3\sqrt{5}}$

$45 = 5 \cdot 9 = 5 \cdot 3 \cdot 3$

Aug 30-9:58 AM

EXAMPLES PAGE 27

EXAMPLE 1: SIMPLIFY, IF POSSIBLE

A) $\sqrt{12} = 2\sqrt{3}$ (12 = 2 · 6, 6 = 2 · 3)

B) $\sqrt{60} = 2\sqrt{3 \cdot 5} = 2\sqrt{15}$ (60 = 2 · 30, 30 = 2 · 15, 15 = 3 · 5)

C) $\sqrt{55} = \sqrt{5 \cdot 11} = \sqrt{55}$ (5 and 11 are prime)

EXAMLE 2: MULTIPLY

A) $\sqrt{3} * \sqrt{10}$

$\sqrt{3 \cdot 10} = \sqrt{30}$ (30 = 2 · 15, 15 = 3 · 5)

B) $\sqrt{10} * \sqrt{10}$

$\sqrt{100} = 10$

C) $\sqrt{6} * \sqrt{2}$

$\sqrt{6 \cdot 2} = \sqrt{12}$

$2\sqrt{3}$ (12 = 2 · 6, 6 = 2 · 3)

Aug 30-10:02 AM

EXAMPLE 3: FIND THE QUOTIENT

A) $\sqrt{80}/\sqrt{5}$

$\sqrt{\frac{80}{5}} = \sqrt{16} = 4$

B) $\sqrt{48}/\sqrt{6}$

$\sqrt{\frac{48}{6}} = \sqrt{8} = 2\sqrt{2}$ (8 = 2 · 4, 4 = 2 · 2)

C) $15/\sqrt{6}$

$\frac{15 \cdot \sqrt{6}}{\sqrt{6} \cdot \sqrt{6}} = \frac{15\sqrt{6}}{6}$

$\frac{5\sqrt{6}}{2}$

D) $\sqrt{(3/5)}$

$\frac{\sqrt{3} \cdot \sqrt{5}}{\sqrt{15} \cdot \sqrt{5}}$ $\sqrt{15}$ / 5

EXAMPLE 4: ADD OR SUBSTRACT

A) $8\sqrt{3} + 10\sqrt{3}$

$18\sqrt{3}$

B) $4\sqrt{13} - 9\sqrt{13}$

$-5\sqrt{13}$

C) $\sqrt{2} + \sqrt{8}$ (8 = 2 · 4, 4 = 2 · 2)

$\sqrt{2} + 2\sqrt{2}$

$3\sqrt{2}$

D) $4\sqrt{50} - 6\sqrt{32}$ (50 = 5 · 10, 10 = 5 · 2; 32 = 2 · 16, 16 = 2 · 8, 8 = 2 · 4)

$4 \cdot 5\sqrt{2}$

$20\sqrt{2} - 6 \cdot 2 \cdot 2\sqrt{2}$

$20\sqrt{2} - 24\sqrt{2}$

$-4\sqrt{2}$

Aug 30-10:04 AM

p. 234

#1, 3, 6, 9, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66

Aug 31-10:23 AM

$\sqrt{3}(\sqrt{6}+2)$

$\sqrt{18}+2\sqrt{3}$

$2 \cdot 9$

$3\sqrt{2}+2\sqrt{3}$

Aug 28-8:31 AM