

3.1 Divide

Dividing Examples: (part 2)

Skill Review: divide fractions (polynomials)

$$\frac{12}{18} = \frac{12 \div 6}{18 \div 6} = \frac{2}{3}$$

$$\frac{24x^3}{16x} = \frac{24(x)(x)(x)}{16(x)} = \frac{3x^2}{2}$$

$$\frac{12x^2y}{16xy^3} = \frac{12(x)(x)(y)}{16(x)(y)(y)(y)} = \frac{3x}{4y^2}$$

TAKE
APART

$$\frac{16x^2 + 24xy}{8x} = \frac{16x^2}{8x} + \frac{24xy}{8x} = 2x + 3y$$

all 3 numbers $\div 8$ all 3 terms $\div x$

1. Divide the following radicals. Simplify if possible.

a. $\frac{\sqrt{18}}{\sqrt{6}} = \frac{\sqrt{3}}{1} = \sqrt{3}$

NUM \div NUM
RAD \div RAD
divide by "self" = 1

b. $\frac{4\sqrt{80}}{8\sqrt{10}} = \frac{1\sqrt{8}}{2(1)} = \frac{\sqrt{8}}{2} = \frac{\sqrt{4 \times 2}}{2} = \frac{2\sqrt{2}}{2} = \sqrt{2}$

NUM \div NUM = $\frac{2\sqrt{2}}{2} = \sqrt{2}$

c. $\frac{\sqrt{125}}{\sqrt{5}} = \sqrt{25} = 5$

d. $\frac{5\sqrt{96}}{\sqrt{12}} = 5\sqrt{8} = 5\sqrt{4 \times 2} = 5(2)\sqrt{2} = 10\sqrt{2}$

new

e. $\frac{3\sqrt{24}}{2\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{3\sqrt{120}}{2\sqrt{25}}$

$$= \frac{3\sqrt{120}}{2(5)} = \frac{3\sqrt{120}}{10}$$

$$= \frac{3\sqrt{4 \times 30}}{10}$$

$$= \frac{3(2)\sqrt{30}}{10}$$

NUM \div NUM

$$= \frac{6\sqrt{30}}{10}$$

$$= \frac{3\sqrt{30}}{5}$$

f. $\frac{2\sqrt{30}}{\sqrt{8}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{60}}{\sqrt{16}}$

NUM \div NUM
RAD \div RAD

$$= \frac{2\sqrt{15}}{\sqrt{4}}$$

$$= \frac{2\sqrt{15}}{2}$$

$$= \sqrt{15}$$

RATIONALIZE DENOMINATOR

3.1 Divide

$$\sqrt{5} \cdot \sqrt{5} = \sqrt{25} = 5$$

$$\sqrt{11} \cdot \sqrt{11} = \sqrt{121} = 11$$

$$\sqrt{8} \cdot \sqrt{8} = \sqrt{64} = 8$$

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

$$\sqrt{12} \cdot \sqrt{12} = \sqrt{144} = 12$$

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number ÷ number radical ÷ radical

2. Divide the following. Rationalize the denominator. Simplify wherever possible.

a. $\frac{10\sqrt{12}}{2\sqrt{2}} = 5\sqrt{6}$

b. $\frac{15\sqrt{24}}{5\sqrt{18}} = \frac{3\sqrt{4}}{\sqrt{3}} = \frac{3(2)}{\sqrt{3}}$

$= \frac{6\sqrt{3}}{\sqrt{3}\sqrt{3}} = \frac{6\sqrt{3}}{\sqrt{9}} = \frac{6\sqrt{3}}{3}$

$= 2\sqrt{3}$

c. $\frac{4\sqrt{6} + 8\sqrt{18}}{2\sqrt{6}} = \frac{2\sqrt{6} + 4\sqrt{3}}{\sqrt{6}}$

$= 2 + 4\sqrt{3}$

d. $\frac{12\sqrt{60} - 15\sqrt{40}}{3\sqrt{5}} = \frac{4\sqrt{12} - 5\sqrt{8}}{\sqrt{5}}$

$= 4\sqrt{12} - 5\sqrt{8}$

$= 4\sqrt{4 \times 3} - 5\sqrt{4 \times 2}$

$= 4(2)\sqrt{3} - 5(2)\sqrt{2}$

$= 8\sqrt{3} - 10\sqrt{2}$

4, 10, 2
2 ÷ 2

e. $\frac{4\sqrt{2} - 10\sqrt{6}}{2\sqrt{3}}$ stay same

$= \frac{2\sqrt{2} - 5\sqrt{6}}{\sqrt{3}} \left[\frac{\sqrt{3}}{\sqrt{3}} \right]$

$= \frac{2\sqrt{6} - 5\sqrt{18}}{\sqrt{9}}$

$= \frac{2\sqrt{6} - 5\sqrt{9 \times 2}}{3} \dots 5(3)$

$= \frac{2\sqrt{6} - 15\sqrt{2}}{3}$

10, 2, 20 ÷ 2

f. $\frac{5 + \sqrt{14}}{\sqrt{20}} \left[\frac{\sqrt{20}}{\sqrt{20}} \right]$

$= \frac{5\sqrt{20} + \sqrt{280}}{\sqrt{400}}$

$= \frac{5\sqrt{4 \times 5} + \sqrt{4 \times 70}}{20}$

$= \frac{5(2)\sqrt{5} + 2\sqrt{70}}{20}$

$= \frac{10\sqrt{5} + 2\sqrt{70}}{20}$

$= \frac{5\sqrt{5} + \sqrt{70}}{10}$

$= \frac{5\sqrt{5} + \sqrt{70}}{10}$