

Rational Number Review

Part 1: Fraction Review

Addition	Subtraction
<p>Find a common denominator.</p> $\frac{7}{20} + \frac{2}{5} = \frac{7}{20} + \frac{8}{20}$ <p>Add numerators.</p> <p>The denominator stays the same.</p> $\frac{7}{20} + \frac{8}{20} = \frac{15}{20}$ <p>Simplify as needed.</p> $\frac{15}{20} = \frac{3}{4}$	<p>Find a common denominator.</p> $\frac{11}{12} - \frac{1}{4} = \frac{11}{12} - \frac{3}{12}$ <p>Subtract the numerators.</p> <p>The denominator stays the same.</p> $\frac{11}{12} - \frac{3}{12} = \frac{8}{12}$ <p>Simplify as needed.</p> $\frac{8}{12} = \frac{2}{3}$
Multiplication	Division
<p>Multiply the numerators.</p> <p>Multiply the denominators.</p> $\frac{4}{5} \times \frac{2}{3} = \frac{8}{15}$ <p>Simplify as needed.</p>	<p>Rewrite the problem as a multiplication problem by inverting the divisor. (Flip the second fraction)</p> $\frac{1}{2} \div \frac{3}{4} = \frac{1}{2} \times \frac{4}{3}$ <p>Multiply the numerators.</p> <p>Multiply the denominators.</p> $\frac{1}{2} \times \frac{4}{3} = \frac{4}{6}$ <p>Simplify as needed.</p> $\frac{4}{6} = \frac{2}{3}$

**Fraction Review:** Simplify. All answer must be in simplified, reduced form. You will need these skills for next unit. Try to do them without a calculator.

1.  $\frac{4}{5} + \frac{3}{5} = \boxed{\frac{7}{5}}$

2.  $\frac{2}{5} + \frac{3}{4} = \frac{8}{20} + \frac{15}{20}$

$\boxed{\frac{23}{20}}$

3.  $\frac{7}{10} - \frac{6}{5} = \frac{7}{10} - \frac{12}{10}$   
 $= \frac{-5}{10} = \boxed{-\frac{1}{2}}$

4.  $\frac{8}{9} + \frac{1}{2} = \frac{16}{18} + \frac{9}{18}$   
 $= \boxed{\frac{25}{18}}$

5.  $\frac{6}{7} \cdot \frac{2}{5} = \frac{12}{35}$

6.  $-\frac{7}{10} - \frac{4}{15} = \frac{-21}{30} - \frac{8}{30}$   
 $= \frac{-29}{30}$

7.  $\frac{42}{3} \cdot \frac{9}{49} = \frac{378}{147} = \boxed{\frac{18}{7}}$

8.  $\frac{10}{3} \div 2 = \frac{10}{3} \cdot \frac{1}{2} = \frac{10}{6} = \boxed{\frac{5}{3}}$

9.  $\frac{8}{1} \div \frac{1}{2} = \frac{8}{1} \cdot \frac{2}{1} = \boxed{16}$

10.  $\frac{2}{3} \cdot 12 = \frac{24}{3} = \boxed{8}$

11.  $\frac{4}{5} \cdot \frac{1}{4} = \frac{4}{20} = \boxed{\frac{1}{5}}$

12.  $\frac{1}{7} \div \frac{3}{4} = \frac{1}{7} \cdot \frac{4}{3} = \frac{4}{21}$

## Part 2: Simplifying Radicals Review

Examples:

### Simplify Radicals

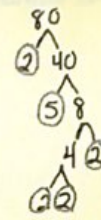
Find Perfect Square

$$\begin{aligned}\sqrt{48} &= \sqrt{16} \times \sqrt{3} \\ &= 4 \times \sqrt{3} \\ &= 4\sqrt{3}\end{aligned}$$

Find Prime Factors

$$\begin{aligned}\sqrt{48} &= \sqrt{2 \times 2 \times 2 \times 2 \times 3} \\ &= \sqrt{2 \times 2} \times \sqrt{2 \times 2} \times \sqrt{3} \\ &= 2 \times 2 \times \sqrt{3} \\ &= 4\sqrt{3}\end{aligned}$$

$$\begin{aligned}\sqrt{80} &= \sqrt{5 \cdot 2 \cdot 2 \cdot 2 \cdot 2} \\ &= \sqrt{5 \cdot 2 \cdot 2} \cdot \sqrt{2 \cdot 2} \\ &= \sqrt{5 \cdot 4} \cdot \sqrt{4} \\ &= \sqrt{5 \cdot 2 \cdot 2} \cdot 2 \\ &= 4\sqrt{5}\end{aligned}$$



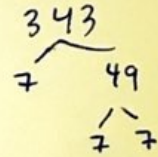
Goal: radical should be either prime or no perfect squares

**Simplifying Radicals:** Simplify. All answer must be in simplified, RADICAL form. (No decimals)

13.  $\sqrt{36} = \boxed{6}$

14.  $\sqrt{81} = \boxed{9}$

15.  $\sqrt{343} = \boxed{7\sqrt{7}}$



16.  $\sqrt{196} = \boxed{14}$

17.  $\sqrt{98} = \boxed{7\sqrt{2}}$

18.  $\sqrt{50} = \boxed{5\sqrt{2}}$

19.  $\sqrt[3]{8} = \boxed{2}$

20.  $\sqrt[6]{512} = \boxed{2^6\sqrt{8}}$

21.  $\sqrt[3]{-448} = \boxed{4\sqrt[3]{-7}}$

## Part 3: Multiplying Radicals Review

Examples: Multiplying Radicals:  $\sqrt{5} \cdot \sqrt{6} = \sqrt{5 \cdot 6} = \sqrt{30}$

AND  $\sqrt{8} \cdot \sqrt{5} = \sqrt{8 \cdot 5} = \sqrt{40} = \sqrt{4 \cdot 10} = 2\sqrt{10}$

Simplify:

22.  $\sqrt{9} \cdot \sqrt{4} = \sqrt{9 \cdot 4} = \sqrt{36} = \boxed{6}$

23.  $\sqrt{8} \cdot \sqrt{20} = \sqrt{8 \cdot 20} = \sqrt{160} = \sqrt{16 \cdot 10} = 4\sqrt{10}$

24.  $\sqrt{12} \cdot \sqrt{10} = \sqrt{12 \cdot 10} = \sqrt{120} = \sqrt{4 \cdot 30} = 2\sqrt{30}$