Adding & Subtracting Rational Numbers

September-30-16
10:45 AM

<div align="center">

Mathematics 9
Rational Numbers
Adding & Subtracting Rational Numbers

</div>

A. Equivalent Rational Numbers

Equivalent rational numbers are fractions which have the same denominator. These are particularly useful when you are asked to compare rational numbers. **Remember to pay particular attention to the integer rules when working with the numbers.**

Put the original rational numbers in order from smallest to largest.

$$\frac{1}{3}_{\times 8}^{\times 8} \qquad -\frac{5}{8}_{\times 3}^{\times 3} \qquad -\frac{2}{3}_{\times 8}^{\times 8} \qquad \frac{5}{6}_{\times 4}^{\times 4} \qquad -\frac{3}{4}_{\times 6}^{\times 6}$$

$$\frac{8}{24} \qquad -\frac{15}{24} \qquad -\frac{16}{24} \qquad \frac{20}{24} \qquad -\frac{18}{24}$$

$$\boxed{-\frac{3}{4}, -\frac{2}{3}, -\frac{5}{8}, \frac{1}{3}, \frac{5}{6}}$$

B. Adding and Subtracting with the Same Denominator

When adding and subtracting you must have the same denominator.

$$\frac{4}{7}+\left(-\frac{2}{7}\right)$$

$$\frac{4}{7} + \frac{-2}{7} = \boxed{\frac{2}{7}}$$

C. Adding & Subtracting with Different Denominators

If the denominators are not the same you will need to find a common denominator and create equivalent fractions before adding or subtracting.

$$\left(\frac{-2}{5}\right)-\frac{1}{3}$$

$$\left(\frac{-2}{5}_{\times 3}^{\times 3}\right) + \left(\frac{-1}{3}_{\times 5}^{\times 5}\right)$$

$$\frac{-6}{15} + \frac{-5}{15} = \boxed{\frac{-11}{15}}$$

E. Practice Questions

1) $-\dfrac{5}{9}+\dfrac{1}{9}$

$\dfrac{-5}{9}+\dfrac{1}{9} = \boxed{-\dfrac{4}{9}}$

2) $-\dfrac{6}{7}-\left(\dfrac{1}{7}\right)$

$\dfrac{-6}{7}+\dfrac{-1}{7} = \dfrac{-7}{7} = \boxed{-1}$

3) $-\dfrac{1^{\times 3}}{2^{\times 3}}+\dfrac{1}{6}$

$\dfrac{-3}{6}+\dfrac{1}{6}$

$= \dfrac{-2 \div 2}{6 \div 2} = \boxed{-\dfrac{1}{3}}$

4) $\left(\dfrac{-2}{3}\right)-\left(\dfrac{1}{4}\right)$

$\dfrac{-2^{\times 4}}{3^{\times 4}}+\dfrac{-1^{\times 3}}{4^{\times 3}}$

$\dfrac{-8}{12}+\dfrac{-3}{12} = \boxed{\dfrac{-11}{12}}$

5) $\left(\dfrac{-5}{8}\right)-\left(\dfrac{1}{-3}\right)$

$\dfrac{-5^{\times 3}}{8^{\times 3}}+\dfrac{1^{\times 8}}{3^{\times 8}}$

$\dfrac{-15}{24}+\dfrac{8}{24} = \boxed{\dfrac{-7}{24}}$

6) $\left(\dfrac{-5}{-8}\right)-\left(\dfrac{-5}{-6}\right)$

$\dfrac{5}{8}-\dfrac{5}{6}$

$\dfrac{5^{\times 3}}{8^{\times 3}}+\dfrac{-5^{\times 4}}{6^{\times 4}}$

$\dfrac{15}{24}+\dfrac{-20}{24} = \boxed{-\dfrac{5}{24}}$

Name:_____

Adding & Subtracting Rational Numbers

1. $\dfrac{3}{9} + \dfrac{8}{27}$

2. $\dfrac{-3}{8} + \dfrac{1}{6}$

3. $\dfrac{2}{5} - \left(-\dfrac{3}{20}\right)$

4. $\left(\dfrac{-6}{9}\right) + \left(-\dfrac{5}{6}\right)$

5. $\dfrac{6}{7} - \dfrac{1}{28}$

6. $\dfrac{-7}{8} - \left(-\dfrac{3}{8}\right)$

7. $\dfrac{3}{10} - \dfrac{5}{8}$

8. $\dfrac{1}{7} - \dfrac{-9}{21}$

9. $\left(\dfrac{-5}{-6}\right)+\left(\dfrac{-3}{4}\right)$

10. $\dfrac{4}{-6}-\dfrac{7}{12}$

11. $\left(\dfrac{-3}{32}\right)-\dfrac{5}{8}$

12. $\dfrac{4}{8}+\dfrac{7}{12}$

13. $\left(-\dfrac{5}{12}\right)-\dfrac{-9}{12}$

14. $\left(-\dfrac{6}{10}\right)-\dfrac{2}{3}$

15. $\left(\dfrac{-2}{3}\right)+\left(\dfrac{3}{-4}\right)$

16. $\dfrac{1}{5}-\left(-\dfrac{4}{7}\right)$

Answers

1) $\dfrac{17}{27}$

2) $-\dfrac{5}{24}$

3) $\dfrac{11}{20}$

4) $-\dfrac{3}{2}$

5) $\dfrac{23}{28}$

6) $-\dfrac{1}{2}$

7) $-\dfrac{13}{40}$

8) $\dfrac{4}{7}$

9) $\dfrac{1}{12}$

10) $-\dfrac{5}{4}$

11) $-\dfrac{23}{32}$

12) $\dfrac{13}{12}$

13) $\dfrac{1}{3}$

14) $-\dfrac{19}{15}$

15) $-\dfrac{17}{12}$

16) $\dfrac{27}{35}$