

5.3 ADDING AND SUBTRACTING RATIONAL NUMBERS

key

The methods used for adding and subtracting rational numbers is the same as the methods used when we added and subtracted integers, fractions and decimals. The examples below show how this is done.

EXAMPLE #1

$$(-4.6) - (+4.3) - (-7.2)$$

$$(-4.6) + (-4.3) + (+7.2) \quad \leftarrow \text{Rewrite as an addition problem.}$$

$$(-8.9) + (+7.2) \quad \leftarrow \text{Combine like terms (those with the same signs).}$$

$$-1.7 \quad \leftarrow \text{Subtract. (More negatives than positives, } \therefore \text{ answer negative).}$$

EXAMPLE #2

$$(+\frac{4}{5}) + (-\frac{2}{3})$$

$$(+\frac{12}{15}) + (-\frac{10}{15}) \quad \leftarrow \text{Convert to equivalent fractions with common denominators.}$$

$$+\frac{2}{15} \quad \leftarrow \text{Subtract numerators. (More positives than negatives, } \therefore \text{ answer positive).}$$

A. Find the sum or difference of each of the following.

1. $(+\frac{3}{7}) + (-\frac{4}{7}) - \frac{1}{7}$
2. $(+\frac{3}{4}) + (-\frac{3}{4}) \bigcirc$
3. $(-\frac{3}{5}) - (+\frac{2}{3}) - 1\frac{4}{15}$
4. $(+\frac{7}{9}) + (-\frac{4}{9}) \frac{1}{3}$
5. $(+\frac{2}{7}) - (+\frac{5}{9}) - \frac{17}{63}$
6. $(-\frac{3}{5}) + (-\frac{1}{15}) - \frac{2}{3}$
7. $(-\frac{8}{9}) + (+\frac{3}{4}) - \frac{5}{36}$
8. $(-5\frac{3}{4}) + (-2\frac{1}{2}) - 8\frac{1}{49}$
9. $(-2\frac{1}{2}) - (-\frac{5}{9}) - 1\frac{17}{18}$
10. $(-\frac{3}{4}) + (+\frac{1}{2}) - \frac{1}{4}$
11. $(+3\frac{2}{3}) - (-\frac{5}{6}) 4\frac{1}{2}$
12. $(-1\frac{3}{4}) - (+2\frac{1}{8}) - 3\frac{7}{8}$
13. $(+\frac{3}{10}) + (-\frac{2}{5}) - \frac{1}{10}$
14. $(+3\frac{2}{3}) + (-\frac{5}{6}) 2\frac{5}{6}$
15. $(+2\frac{3}{10}) + (-5\frac{3}{5}) - 3\frac{3}{10}$
16. $(-\frac{5}{8}) - (+\frac{1}{6}) - \frac{19}{24}$
17. $(-\frac{5}{6}) + (-\frac{8}{9}) - 1\frac{13}{18}$
18. $(-6\frac{1}{3}) - (+2\frac{1}{4}) - 8\frac{7}{12}$
19. $(-\frac{3}{11}) + (+\frac{5}{8}) \frac{31}{88}$
20. $(+9\frac{1}{8}) + (+6\frac{3}{4}) 15\frac{7}{8}$
21. $(+\frac{3}{4}) - (-\frac{5}{6}) 1\frac{7}{12}$
22. $(3\frac{1}{3}) + (+2\frac{4}{5}) 6\frac{2}{15}$
23. $(+15) + (-9\frac{3}{4}) 5\frac{1}{4}$
24. $(-16) + (-5\frac{2}{3}) - 21\frac{2}{3}$
25. $(+6\frac{3}{8}) + (-1\frac{3}{4}) 4\frac{5}{8}$
26. $(+\frac{3}{4}) + (-\frac{2}{3}) \frac{1}{12}$
27. $(+\frac{2}{7}) - (+\frac{5}{3}) - 1\frac{8}{21}$
28. $(-\frac{5}{9}) + (-\frac{1}{2}) - 1\frac{1}{18}$
29. $(+\frac{2}{3}) - (+\frac{4}{8}) \frac{1}{6}$
30. $(-3\frac{1}{4}) + (-5\frac{1}{5}) - 8\frac{9}{20}$

B. Find the sum or difference of each the following.

1. $(+37.65) + (-15.2)$ 22.45
2. $(-16.5) - (+15.2) + (-13.2)$ -44.9
3. $(+15.68) + (-14.1) + (+11.3)$ 12.88
4. $(-0.36) + (+15.7) + (-14.2) - (+18.6)$ -17.2
5. $(+6.68) + (+13.02) + (+18.762)$ 38.462
6. $(-14.35) + (-16.2) - (+104.6) + (-37.8)$ -172.95
7. $(+56) + (-13) - (+14.3)$ 28.7
8. $(-43.5) + (+56.7) + (-14.2)$ -1
9. $(-16.923) + (-15.46) - (-5.3)$ -27.083
10. $(-2.3) - (+5.6) - (+0.004)$ -7.904

C. Extra Practice. Add or subtract the following.

1. $(+3/8) - (-2/3)$ $1\frac{1}{24}$
2. $(-4/3) + (-2/8)$ $-1\frac{7}{12}$
3. $(+3/10) - (-2/5)$ $7/10$
4. $(+6/11) - (-1/3)$ $29/33$
5. $(+4\frac{2}{3}) - (+3\frac{5}{6})$ $5/6$
6. $(-3\frac{2}{3}) - (-4\frac{1}{2})$ $5/6$
7. $(+3/4) + (-1/4)$ $1/2$
8. $(+2/3) + (+3/4)$ $17/12$
9. $(+2/5) - (+3/8)$ $1/40$
10. $(+1/6) - (+4/7)$ $-17/42$
11. $(+3/10) + (-1/4)$ $1/20$
12. $(+5/6) + (-3/4)$ $1/12$
13. $(-9/10) + (-1/3)$ $-17/30$
14. $(-5/8) - (+3/6)$ $-11/8$
15. $(+3\frac{5}{6}) + (-3\frac{2}{3})$ $1/6$
16. $(+3\frac{5}{8}) - (+8)$ $-4\frac{3}{8}$
17. $(+4\frac{1}{2}) - (-1\frac{3}{8})$ $5\frac{7}{8}$
18. $(+5\frac{3}{7}) - (+4\frac{8}{14})$ $6/7$
19. $(+2\frac{1}{2}) + (-3\frac{3}{4})$ $-1\frac{1}{4}$
20. $(+7) - (+5\frac{3}{4})$ $1\frac{1}{4}$
21. $(+2/5) - (-3/8)$ $31/40$
22. $(+3) - (+2\frac{3}{4})$ $1/4$
23. $(+11) - (-5\frac{6}{7})$ $16\frac{6}{7}$
24. $(+3\frac{7}{15}) + (-2\frac{5}{6})$ $19/30$
25. $(+1/3) - (-1/7)$ $10/21$
26. $(+7/8) + (+5/9)$ $77/72$
27. $(+3/5) - (+7/2) - (+10/15)$ $-3\frac{17}{30}$
28. $(+5/8) + (-7/8)$ $-1/4$
29. $(+2\frac{3}{8}) + (-3\frac{1}{4})$ $-1\frac{1}{8}$
30. $(-2\frac{3}{5}) - (+7/10)$ $-3\frac{3}{10}$

D. Extra Practice. Add or subtract the following.

1. $(+35.6) - (-14.2)$ 49.8
2. $(-83.26) - (-15.6) + (-18.2)$ -85.86
3. $(+9.076) + (-14.63)$ -5.554
4. $(-7.68) + (+5.32) + (-7.87)$ -10.23
5. $(-18.46) - (-18.79) - (+18.46)$ -18.13
6. $(-5.36) - (+5.94) + (-9.34)$ -20.64
7. $(-16.304) + (-18.63) - (+103)$ -137.934
8. $(-0.123) - (+0.234) + (-0.345)$ -0.702
9. $(-3.5) - (+4.2) + (-5.62)$ -13.32
10. $(-15.37) + (-14.35) + (+6.2)$ -23.52