

Key Terms

- **rational number:** any number that can be written in fraction form. In decimal form, a rational number is a decimal that either terminates or repeats.
- **irrational number:** a number that cannot be written in fraction form. In decimal form, an irrational number does not terminate and does not repeat. Example: π and $\sqrt{2}$.
- **terminating decimal:** a decimal with a certain number of digits after the decimal point; for example, $\frac{1}{8} = 0.125$.
- **repeating decimal:** a decimal with a repeating pattern in the digits to the right of the decimal point; it is written with a bar above the repeating digits; for example, $\frac{2}{3} = 0.\bar{6}$
- **improper fraction:** a fraction with the numerator greater than the denominator; for example, both $\frac{6}{5}$ and $\frac{5}{3}$ are improper fractions.
- **mixed number:** a number consisting of a whole number and a fraction; for example, $1\frac{2}{3}$ is a mixed number.

Operations with Fractions

- **Adding and Subtracting Fractions:** Before you can add or subtract fractions, you must have a common denominator for all fractions involved. Once there's a common denominator, the numerators can be added or subtracted, and the final fraction can be reduced as much as possible. If the original question contains fractions in the mixed number form, change them to improper fractions first, and then solve.
- **Multiplying Fractions:** Multiply the numerators (across the top) and the denominators (across the bottom). Reduce the final fraction as much as possible. If the original question contains fractions in the mixed number form, change them to improper fractions first, and then solve.
- **Divide Fractions:** Before you can divide fractions, you must change the division sign to a multiplication sign and then flip the second fraction. Then you will multiply the fractions as normal.

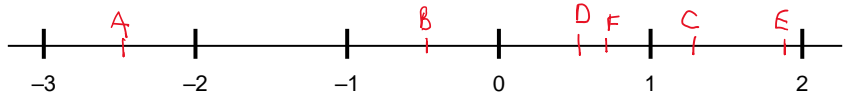
Example Problems

1. Which of the following rational numbers are equal to $-\frac{5}{4}$?

$\frac{-5}{4}, \frac{-5}{-4}, \frac{10}{8}, \frac{5}{-4}$

2. Mark each rational number on the number line provided.

$-2.5, -\frac{1}{2}, 1.2, 0.5, 1.9, \frac{3}{4}$
A B C D E F



3. In each pair, which number is greater? Explain your answer.

a) $\frac{6}{5}, \frac{5}{6}$ Improper fractions like $\frac{6}{5}$ are greater than one while regular fractions are less than one.
b) $-3, -4$ It is further to the right on the number line

4. Determine each sum or difference.

a) $\frac{3}{5} + \left(\frac{2}{5}\right) = \frac{5}{5} = 1$ b) $\frac{3}{4} - \left(\frac{1}{4}\right) = \frac{2}{4}$ or $\frac{1}{2}$ c) $\frac{7}{8} + \frac{-1}{8} = \frac{6}{8}$ or $\frac{3}{4}$ d) $\frac{2}{3} + \frac{1}{4}$
 $\frac{8}{12} + \frac{3}{12} = \frac{11}{12}$

Keep/Change/Flip

5. Evaluate.

a) $\frac{1}{4} \times \left(\frac{3}{5}\right) = \frac{3}{20}$ b) $\frac{5}{6} \div \left(\frac{2}{3}\right) = \frac{5}{6} \times \frac{3}{2} = \frac{15}{12} = \frac{5}{4}$ or $1\frac{1}{4}$

6. Evaluate.

a. $2 + 3 \times 4$
 $2 + 12 = 14$
b. $(3 - 1) \times 4$
 $2 \times 4 = 8$
c. $8 \div 2 + 4 \times 5$
 $4 + 4 \times 5 = 4 + 20 = 24$
d. $2^2 + 5 - 10 \div 5$
 $4 + 5 - 10 \div 5 = 4 + 5 - 2 = 9 - 2 = 7$

7. Evaluate.

a. $(-2) + (-4) = -6$
b. $(-6) - (-5) = -6 + (+5) = -1$
c. $(-3) \times (-6) = 18$
d. $(-24) \div (-4) = 6$

8. The following temperatures were recorded at the Port Hardy, B.C. airport at noon in one week:

-5°C , 6°C , -1°C , 0.5°C , 1°C , -0.7°C , -7°C

- a) Place the temperatures above in order from least to greatest. $-7, -5, -1, -0.7, 0.5, 1, 6$
- b) What is the highest temperature recorded at the Port Hardy, B.C. airport? 6°C
- c) What is the lowest temperature recorded at the Port Hardy, B.C. airport? -7°C

9. This table shows the money earned and spent by Kelsey in the first month of operating her home based computer business.

Item	Income	Spending
New computer		\$760
Additional software		\$65
Contract No. 1	\$490	
Contract No. 2	\$390	
Miscellaneous expenses		\$260

a) Write an addition statement to show Kelsey's income and spending.

$$490 + 390 - 760 - 65 - 260 = -205$$

b) Did Kelsey make a profit in her business?

NO. She is \$205 in the hole. (-205)

10. At a harbour, the effect of the tide changed the water level by 24 m in 4 h. About how much did the water level change per hour?

$$24\text{m} \div 4\text{h} = 6\text{m per hour}$$

11. A student has \$120 in her savings account. She withdraws \$5 each week. Determine the amount of money remaining in her account after 6 weeks.

$$120 - (5 \times 6)$$

$$120 - 30 = 90$$

12. At a resort, the temperature at 7 am was 5°C . It increased by an average of 3°C each hour until 20°C . How long did it take to reach this temperature?

$$(20 - 5) \div 3$$

$$15 \div 3 = 5$$

5 hours.

13. Change to improper fractions:

a. $3\frac{2}{3}$ $(3 \times 3 + 2) = \frac{11}{3}$

b. $2\frac{1}{2}$ $(2 \times 2 + 1) = \frac{5}{2}$

14. Write as decimals: a. $1/5$

0.2

b. $4/10$

0.4

c. $3/4$

0.75

d. $1/2$

0.5