

Grade 8

NUMBER SENSE AND NUMERATION: FRACTIONS AND RATIONALS

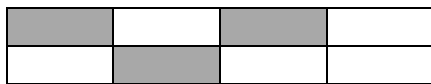
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Play the **Fish Tank** game first! Levels 2 and 3 are recommended.

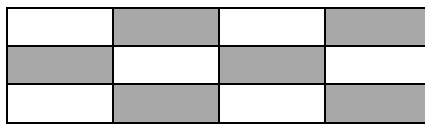
Click on <http://www.bbc.co.uk/education/mathsfile/shockwave/games/fish.html> or go to www.wiredmath.ca for the link.

1. Write a fraction to represent the shaded part. Write your final answer in lowest terms.

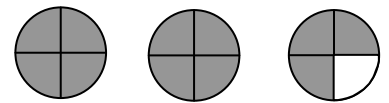
a.



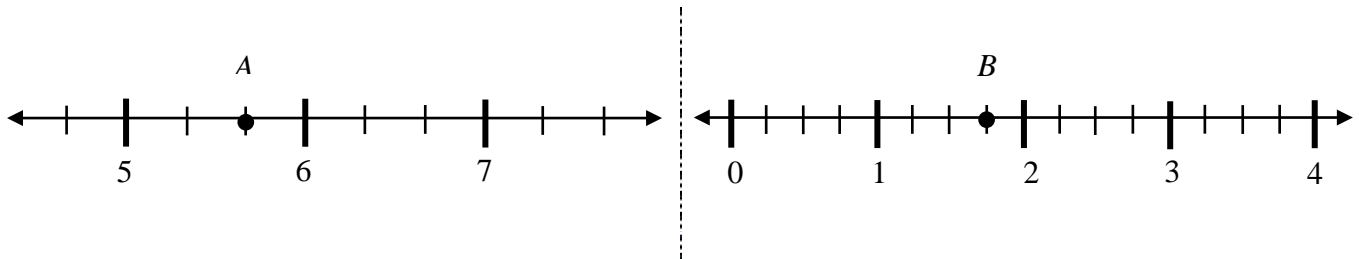
b.



c.



2. Write a mixed number to represent points *A* and *B* below.



3. Change to equivalent mixed numbers in lowest terms.

a. $\frac{13}{4} = \square \frac{\quad}{4}$

b. $\frac{7}{6} = \square \frac{\quad}{6}$

c. $-\frac{3}{2} = \square \frac{\quad}{2}$

$\frac{6}{7}$ is a **proper** fraction
(less than one but larger than zero)

$\frac{8}{3}$ is an **improper** fraction
(numerator is greater than its denominator)

$2\frac{3}{5}$ is a **mixed** number
(sum of a whole number and a fraction)

$-3\frac{5}{7}$ is **equivalent** to the rational $-\frac{26}{7}$

4. Write each mixed number as an improper fraction.

a. $5\frac{3}{4}$

b. $2\frac{5}{9}$

c. $-1\frac{2}{5}$

Keep in Mind...

$$-3\frac{4}{5} = -\frac{5 \times 3 + 4}{5} = -\frac{19}{5}$$

$$5\frac{3}{4} = 5 + \frac{3}{4} = 5 \times \frac{4}{4} + \frac{3}{4} = \frac{23}{4}$$

5. Write either $>$ or $<$ between each pair of rational numbers.

a. $\frac{3}{8}$ $\frac{2}{5}$

b. $\frac{5}{6}$ $\frac{4}{5}$

c. $-\frac{5}{6}$ $-\frac{9}{11}$

d. $2\frac{3}{4}$ $2\frac{2}{5}$

6. Write the fractions $1\frac{1}{4}$, $-\frac{7}{8}$, $-\frac{1}{2}$, $\frac{7}{12}$ in ascending order.

7. The value of $\frac{n}{40}$ lies between $\frac{1}{5}$ and $\frac{1}{4}$. Determine a possible value of n .

8. Determine the value of each of the following. Write your final answer in lowest terms.

a. $\frac{3}{8} + \frac{2}{3}$

b. $\frac{4}{3} - \frac{3}{5}$

c. $\frac{4}{5} + \frac{1}{2} - \frac{3}{4}$

d. $\frac{2}{3} + \frac{7}{15}$

e. $\frac{5}{6} - \frac{1}{2} - \frac{2}{3}$

f. $4 - \frac{8}{9} - \frac{1}{3}$

g. $\frac{3}{5} - \frac{7}{12} + \frac{5}{6}$

h. $\frac{3}{5} + \frac{3}{5} + \frac{3}{5} - \frac{4}{7} - \frac{4}{7}$

9. Determine each of the following products or quotients.

a. $\frac{3}{7} \times \frac{2}{5}$

b. $\frac{3}{5} \times 7$

c. $32 \times \frac{7}{2}$

d. $1\frac{3}{4} \times 5\frac{3}{10}$

e. $\frac{6}{7} \div \frac{3}{5}$

f. $\frac{2}{9} \div \frac{1}{4}$

g. $\frac{5}{9} \div 1\frac{2}{3}$

h. $5\frac{3}{5} \div 1\frac{2}{3}$

10. The sum of the numbers in each row, column, and diagonal is $-\frac{1}{2}$.

Complete the magic square.

	$\frac{1}{2}$	$-\frac{2}{3}$
	$-\frac{5}{6}$	

11. A recipe for fruit punch to serve 4 persons follows: $\frac{1}{2}$ cup orange juice, 1 cup pineapple juice,



$\frac{3}{5}$ cup of water, and $\frac{1}{3}$ cup syrup.

- What amount of each ingredient would you use to make punch for 6 persons?
- What amount of each ingredient would you use to make punch for 3 persons?

12. Simplify each of the following.

a. $\frac{5}{6} - \frac{1}{3} \times \frac{1}{2}$

b. $16 \times \frac{3}{8} + \frac{2}{5}$

c. $3\frac{1}{2} \div \frac{3}{4} \times \frac{2}{3}$

d. $\frac{2}{5} \times \frac{3}{7} \div \frac{9}{35}$

e. $5\left(\frac{2}{3}\right) + 4\left(\frac{5}{6}\right) \div 3\left(\frac{1}{4}\right)$

f. $\frac{2}{5} \times \left(\frac{7}{8} + \frac{3}{4}\right)$

g. $\left(\frac{3}{4} - \frac{1}{3}\right) \times \frac{3}{8} + \frac{1}{4}$

h. $5^2 - 2\frac{2}{3} \times 3 - \frac{3}{5}$

A Slice of History

In ancient times, humans observed fractions in nature.

In particular, they noticed that each season lasts



approximately $\frac{1}{4}$ of the year.

Don't forget to try these math drills now! Go to www.wiredmath.ca for the link.

TRY THESE!

Simplifying Fractions

<http://www.aaamath.com/B/fra66hx2.htm>

Adding Fractions with different denominators

<http://www.aaamath.com/B/fra66kx2.htm>



Multiplying Fractions

<http://www.aaamath.com/B/fra66mx2.htm>

13.

TRY THIS NUMBER PROBLEM!

Using sixteen 4's write an expression that has a value of 1000.

EXTENSIONS!

14. Lesley gave $\frac{1}{4}$ of a pizza to her sister and another $\frac{1}{4}$ to her mother and $\frac{1}{3}$ of the remaining to her father. What fraction of the pizza is left for her friend Matt?



15. Determine the reciprocal of $1 + \frac{1}{1 + \frac{1}{2}}$.

16. If $11 = 1 - \frac{1}{1 - \frac{1}{1 - \frac{1}{x}}}$, determine x .

Did You Know?

Two men from the city of Bologna, Italy expressed the square root of 13 and the square root of 18 as continued fractions.

$$\sqrt{13}$$

$$\sqrt{18}$$