

MPM1D WORK WITH FRACTIONS

Operations with Fractions

Adding and Subtracting

- 1st Change any mixed fraction to an improper fraction.
- 2nd Simplify the negative signs.
- 3rd Find the lowest common denominator for the fractions.
- 4th Make equivalent fractions using the LCD.
- 5th Add and/or subtract the numerators as is needed and make one fraction out of them with the same LCD.
- 6th Take a look at your answer and try to reduce the fraction if possible.

Multiplying Fractions

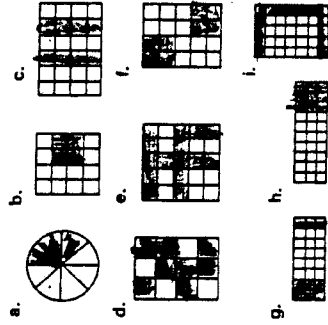
- 1st Change any mixed fraction to an improper fraction.
- 2nd Simplify the negative signs.
- 3rd Reduce any of the fractions if possible.
- 4th Reduce any numerator with any denominator as much as possible.
- 5th Multiply the numerators first, then the denominators and write as one fraction.
- 6th Take a look at your answer and try to reduce the fraction if possible.

Dividing Fractions

- 1st Change the operation to multiplication and write the reciprocal of the fraction to the right of the operation.
- 2nd Follow the steps above for multiplying fractions.

APPLICATIONS AND EXERCISES

1. What fraction of the figure is shaded? Express as two equivalent fractions.



2. Write the equivalent fraction.

- a. $\frac{3}{5} = \frac{8}{10}$ b. $\frac{2}{3} = \frac{10}{15}$ c. $\frac{1}{4} = \frac{12}{27}$
 d. $\frac{10}{12} = \frac{5}{6}$ e. $\frac{18}{4} = \frac{9}{2}$ f. $\frac{7}{1} = \frac{0}{5}$

3. Which is greater?

- a. $\frac{5}{6}$ or $\frac{7}{8}$ b. $\frac{1}{3}$ or $\frac{2}{7}$ c. $\frac{4}{7}$ or $\frac{5}{8}$

4. Express as a fraction greater than 1.

- a. $1\frac{1}{4}$ b. $2\frac{2}{3}$ c. $5\frac{1}{9}$ d. $3\frac{1}{5}$

5. Express as a mixed number.

- a. $\frac{7}{5}$ b. $\frac{9}{4}$ c. $\frac{10}{3}$ d. $\frac{12}{5}$

6. Find the sum or difference.

- a. $\frac{2}{3} + \frac{1}{4}$ b. $\frac{3}{5} + \frac{2}{4}$ c. $\frac{2}{3} + \frac{3}{10}$
 d. $\frac{5}{7} - \frac{2}{7}$ e. $\frac{7}{12} - \frac{1}{3}$ f. $\frac{2}{4} - \frac{2}{5}$
 g. $\frac{5}{6} - \frac{1}{2}$ h. $3 + 2\frac{5}{8}$ i. $2\frac{3}{4} - 1\frac{1}{2}$
 j. $5\frac{1}{2} + 5\frac{2}{3}$ k. $6\frac{3}{4} + 3\frac{1}{3}$ l. $9\frac{2}{3} - 7\frac{1}{2}$
 m. $3 - 2\frac{5}{8}$ n. $1\frac{1}{2} - \frac{5}{8}$ o. $4\frac{1}{4} - 1\frac{3}{8}$

7. Amiel spent $4\frac{1}{2}$ h working on the written part of a project, and Molly spent $3\frac{3}{4}$ h drawing the scale diagrams for the project.

- a. How much time did they spend altogether?
 b. How much more time did Amiel spend?

8. What fraction of the total time on a trip is spent travelling if $\frac{1}{3}$ of the time is spent sleeping and $\frac{1}{4}$ of the time is spent eating?

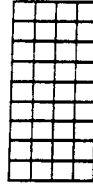
9. Find the result.

- a. $\frac{5}{6} + \frac{1}{10} + \frac{2}{5}$ b. $\frac{2}{3} - \frac{4}{7} + \frac{1}{2}$
 c. $\frac{3}{8} - \frac{2}{5} + \frac{5}{12}$ d. $\frac{7}{6} + 5\frac{1}{2} + 2\frac{5}{6}$
 e. $2\frac{1}{2} - 1\frac{3}{4} + \frac{5}{8}$ f. $2\frac{1}{2} - 1\frac{1}{4} - \frac{1}{3}$
 g. $\frac{1}{8} + (\frac{2}{4} - \frac{1}{3})$ h. $(\frac{1}{6} + \frac{3}{4}) - \frac{1}{3}$

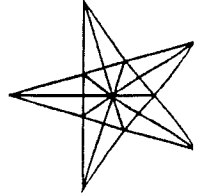
10. Find the result.

- a. $(\frac{1}{2} + \frac{2}{3}) \times \frac{4}{9}$ b. $1\frac{5}{8} - (\frac{2}{5} + \frac{3}{4})$
 c. $\frac{2}{6} + \frac{1}{3} \times \frac{4}{9}$ d. $\frac{5}{9} \times \frac{3}{8} - \frac{5}{6}$
 e. $\frac{4}{9} \times \frac{2}{4} - \frac{5}{6} \times \frac{2}{5}$ f. $4 - 9 \times \frac{0}{10} + \frac{1}{3}$
 g. $4\frac{2}{7} + \frac{9}{3} \times \frac{9}{10}$ h. $\frac{7}{8} - \frac{3}{4} \times \frac{4}{9}$

A. How many squares are in the diagram?



B. How many triangles are in the diagram?



ADDING & SUBTRACTING FRACTIONS

1. $\frac{2}{7} + \frac{3}{7}$

3. $\frac{2}{3} + \frac{5}{6}$

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

2. $\frac{6}{9} - \frac{4}{9}$

4. $\frac{4}{5} - \frac{1}{10}$

6. $\frac{7}{9} - \frac{2}{5}$

ADDING & SUBTRACTING FRACTIONS - Mixed.

1. $1\frac{2}{3} + 1\frac{3}{4}$

4. $3\frac{5}{9} + 2\frac{4}{5}$

7. $5\frac{7}{10} - 3\frac{2}{5}$

2. $2\frac{1}{5} + 3\frac{3}{10}$

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

8. $4\frac{3}{7} - 1\frac{3}{8}$

3. $4\frac{5}{12} + \frac{1}{6}$

6. $4\frac{5}{6} - \frac{2}{3}$

MULTIPLYING FRACTIONS

1. $\frac{1}{5} \times \frac{1}{3}$

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

7. $3\frac{2}{5} \times 2\frac{1}{2}$

2. $\frac{2}{5} \times \frac{10}{12}$

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

8. $2\frac{4}{7} \times 4\frac{2}{3}$

3. $\frac{16}{4} \times \frac{7}{8}$

6. $2\frac{1}{4} \times 3\frac{1}{3}$

DIVIDING FRACTIONS

(1) $\frac{3}{8} \div \frac{3}{4}$

(4) $\frac{4}{5} \div \frac{1}{5}$

(7) $5 \div \frac{5}{6}$

(2) $\frac{6}{7} \div \frac{10}{21}$

(5) $3\frac{2}{3} \div 1\frac{1}{6}$

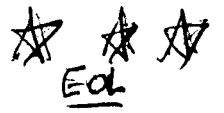
(8) $8 \div \frac{1}{4}$

(3) $\frac{3}{4} \div 3$

(6) $5\frac{3}{5} \div 2\frac{2}{15}$

(9) $10 \div \frac{2}{3}$

MPM 100 MORE FRACTIONS WORK - Negative Fractions!



Every other letter starting with a) for all of the numbered questions. Show a full solution!

A. Adding and Subtracting

1. Simplify.

- (a) $\frac{5}{3} + \frac{-2}{3}$ (b) $\frac{3}{4} + \frac{-1}{4}$ (c) $\frac{-3}{8} + \frac{5}{8}$
 (d) $1\frac{1}{4} + \frac{-3}{4}$ (e) $\frac{-1}{6} + \frac{1}{6}$ (f) $-\frac{7}{8} + (-\frac{1}{8})$
 (g) $\frac{-5}{10} + \frac{1}{10}$ (h) $\frac{-5}{6} + \frac{-1}{6}$ (i) $\frac{-4}{5} + (-\frac{1}{5})$

2. Simplify.

- (a) $\frac{5}{7} - \frac{2}{7}$ (b) $\frac{3}{5} - \frac{-1}{5}$ (c) $\frac{-3}{4} - \frac{1}{4}$
 (d) $\frac{-3}{2} - \frac{1}{2}$ (e) $\frac{-3}{7} - \frac{-5}{7}$ (f) $\frac{1}{3} - \frac{-2}{3}$
 (g) $-\frac{1}{5} - (-\frac{1}{5})$ (h) $-1\frac{1}{2} - \frac{1}{2}$ (i) $0 - \frac{-1}{2}$

3. Simplify.

- (a) $2\frac{1}{3} + \frac{-5}{3}$ (b) $\frac{-3}{5} + 2$
 (c) $\frac{-2}{3} + \frac{3}{4}$ (d) $\frac{5}{8} - \frac{-3}{5}$
 (e) $1\frac{1}{3} - \frac{-5}{12}$ (f) $\frac{4}{3} - (-\frac{3}{5})$
 (g) $\frac{1}{5} - (-1\frac{1}{10})$ (h) $3\frac{1}{8} + \frac{-5}{4}$

4. Simplify.

- (a) $1\frac{1}{2} + \frac{-5}{6} + \frac{1}{3}$ (b) $\frac{-7}{8} + \frac{-1}{2} - 2\frac{1}{8}$
 (c) $1\frac{1}{8} - \frac{-5}{2} + \frac{-5}{6}$ (d) $\frac{3}{8} + \frac{1}{8} - (-1\frac{1}{3})$
 (e) $3\frac{1}{10} - \frac{-3}{100} + 1$ (f) $\frac{-5}{8} - \frac{-1}{4} + (-1\frac{1}{2})$

B. Multiplying

1. Simplify.

- (a) $\frac{3}{4} \times \frac{1}{7}$ (b) $\frac{1}{2} \times \frac{2}{3}$
 (c) $\frac{-2}{3} \times \frac{1}{5}$ (d) $\frac{-2}{5} \times \frac{-1}{3}$
 (e) $2 \times \frac{3}{5}$ (f) $-\frac{3}{11} \times \frac{2}{5}$
 (g) $\frac{1}{5} \times (-\frac{2}{11})$ (h) $\frac{-4}{3} \times \frac{-3}{4}$

2. Find the products.

- (a) $1\frac{1}{4} \times \frac{2}{3}$ (b) $3\frac{1}{2} \times \frac{-3}{14}$
 (c) $\frac{-2}{5} \times 5\frac{1}{6}$ (d) $\frac{-3}{7} \times 1\frac{5}{6}$
 (e) $-1\frac{1}{3} \times 1\frac{1}{2}$ (f) $-3(4\frac{1}{3})$
 (g) $(-1\frac{1}{3})(-4\frac{1}{2})$ (h) $-3(5\frac{2}{3})$

3. Simplify.

- (a) $\frac{-1}{3} \times \frac{7}{8} \times \frac{1}{2}$ (b) $\frac{5}{8} \times 1\frac{2}{3} \times \frac{-3}{10}$
 (c) $(-1\frac{1}{5})(\frac{-2}{3})(\frac{-5}{12})$ (d) $2\frac{1}{3} \times \frac{-3}{4} \times 0$
 (e) $(1\frac{1}{2})(\frac{-1}{3}) \times 3$ (f) $(\frac{-5}{3} \times \frac{3}{10})(-2)$
 (g) $(-\frac{3}{5})(1\frac{7}{10})(-\frac{5}{3})$ (h) $\frac{-1}{10} \times \frac{-3}{5} \times \frac{5}{6}$

4. Simplify.

- (a) $(\frac{3}{4})^2$ (b) $(\frac{-1}{2})^2$ (c) $(\frac{-4}{5})^2$
 (d) $(\frac{1}{10})^3$ (e) $(-\frac{1}{3})^3$ (f) $5 \times (-\frac{1}{5})^2$
 (g) $(\frac{1}{3})^3(-3)$ (h) $(\frac{-2}{3})^2(\frac{1}{2})^3$ (i) $(\frac{-3}{4} \times \frac{2}{5})^2$

C. Dividing

1. State the reciprocal of each of the following.

- (a) $\frac{2}{3}$ (b) $\frac{5}{6}$ (c) $\frac{-3}{4}$
 (d) $-\frac{2}{5}$ (e) $1\frac{1}{2}$ (f) $3\frac{1}{7}$
 (g) $-5\frac{1}{2}$ (h) 5 (i) -3

2. Simplify.

- (a) $\frac{1}{4} \div \frac{1}{2}$ (b) $\frac{2}{3} \div (-2)$ (c) $-3 \div \frac{1}{3}$
 (d) $\frac{-2}{3} \div \frac{-2}{3}$ (e) $\frac{-1}{2} \div 2$ (f) $1\frac{1}{3} \div (-1\frac{1}{3})$

3. Simplify.

- (a) $2\frac{1}{4} \div \frac{1}{2}$ (b) $\frac{-4}{3} \div \frac{8}{9}$
 (c) $(-1\frac{1}{2}) \div \frac{2}{3}$ (d) $1 \div \frac{5}{6}$

D. Order of Operations

1. Simplify.

- (a) $\frac{-3}{4} \times \frac{2}{3} + \frac{-3}{4}$
 (b) $\frac{2}{3}(\frac{-2}{3} + \frac{1}{2})$
 (c) $\frac{3}{4} + \frac{-2}{3} \times 1\frac{1}{2}$
 (d) $(1\frac{1}{4} - \frac{-2}{3}) \div 12$
 (e) $(\frac{-1}{2} + \frac{1}{3})(\frac{2}{3} + \frac{1}{2})$
 (f) $\frac{1}{2} \times \frac{-3}{4} + \frac{1}{2} \times \frac{5}{6}$
 (g) $(-2\frac{1}{5} + \frac{-3}{4}) \div \frac{2}{3} \times \frac{1}{5}$
 (h) $(\frac{1}{2} - \frac{-2}{5}) - (\frac{-1}{2} - 2)$
 (i) $(5 - \frac{-1}{3}) - (\frac{2}{3} - 2)$

2. Simplify.

- (a) $\frac{-2}{5} + \frac{3}{4}$
 (b) $\frac{-7}{8} + 1\frac{1}{4}$
 (c) $\frac{-2}{5} \times 1\frac{2}{3}$
 (d) $\frac{5}{6} - \frac{-1}{3}$

3. Simplify.

- (a) $\frac{-1}{8} \times \frac{2}{3} \div \frac{-1}{3}$ (b) $(3\frac{1}{4}) \div \frac{-3}{2} \times 1\frac{1}{3}$
 (c) $1\frac{1}{3}(\frac{3}{4} \div \frac{-3}{10})$ (d) $3\frac{1}{4} \times 1\frac{1}{5} \div \frac{-13}{6}$

- (b) $\frac{1}{3} - \frac{1}{2}$
 (c) $\frac{2}{3} + \frac{1}{5}$
 (d) $\frac{1\frac{1}{3} \times \frac{3}{8}}{\frac{4}{3} + \frac{1}{8}}$
 (f) $\frac{\frac{1}{2} + \frac{-3}{5} -}{\frac{1}{15} \times (-3)}$

ADDING DECIMALS

① $3.2 + 4.7$

4. $6.2 + 0.58$

7. $2.4 + 0.03$

10.

② $12.5 + 6.9$

5. $0.7 + 1.79$

8. $0.052 + 0.46$

124.5
0.86

③ $0.42 + 0.6$

6. $28.3 + 10.4$

9. $8 + 0.27$

SUBTRACTING DECIMALS

① $9.5 - 4.3$

4. $5.45 - 3.6$

7. $0.25 - 0.16$

10.

② $6.3 - 2.8$

5. $3.2 - 1.18$

8. $14.04 - 0.15$

0.403 - 0.02

③ $7 - 4.3$

6. $9.45 - 3$

9. $8.2 - 0.05$

MULTIPLYING DECIMALS

① 4×0.3

4. 3.2×1.5

7. 10×2.4

10.

② 5×2.4

5. 0.8×0.3

8. 100×0.63

3.4×2.06

③ 9×0.08

6. 0.4×0.05

9. 100×2.143

DIVIDING DECIMALS

① $6 \overline{)5.4}$

4. $63.9 \div 0.3$

7. $23 \div 0.1$

10.

② $4 \overline{)12.8}$

5. $4.5 \div 1.5$

8. $42 \div 0.01$

$55 \div 0.5$

③ $0.5 \overline{)10.25}$

6. $14.4 \div 0.12$

9. $6.24 \div 0.02$

ANSWERS Sept 9/09

"WORK WITH FRACTIONS"

#2 a) 15 b) 14 c) 9 d) 9 e) 9 f) 35

#4 a) $\frac{5}{4}$ b) $\frac{8}{3}$ c) $\frac{4}{9}$ d) $\frac{16}{5}$

#5 a) $1\frac{2}{5}$ b) $2\frac{1}{4}$ c) $3\frac{1}{3}$ d) $2\frac{2}{5}$

#6 a) $\frac{11}{12}$ d) $\frac{3}{7}$ g) $\frac{1}{3}$ j) $\frac{109}{10}$ m) $\frac{3}{8}$

#7 a) $8\frac{1}{4}h$ b) $\frac{3}{4}h$

#9 a) $\frac{4}{3}$ c) $\frac{1}{8}$ e) $\frac{11}{8}$ g) $\frac{13}{24}$

#10 a) $\frac{14}{27}$ e) 0 g) $\frac{41}{35}$

Reverse side "Dividing Fractions"

① $\frac{1}{2}$ ② $\frac{9}{5}$ ③ $\frac{1}{4}$ ④ 4 ⑤ $\frac{22}{7}$ ⑥ $\frac{21}{8}$

⑦ 6 ⑧ 32 ⑨ 15

More Fractions:

1 a) $\frac{3}{28}$ c) $-\frac{3}{10}$ e) $\frac{6}{5}$ g) $-\frac{2}{55}$

2 a) $\frac{5}{6}$ c) $-\frac{31}{15}$ e) -2 g) 6

3 a) $\frac{7}{-48}$ c) $\frac{1}{6}$ e) $-\frac{9}{5}$ g) $\frac{17}{10}$

4 a) $\frac{9}{16}$ d) $\frac{1}{1000}$ g) $-\frac{1}{9}$

D. 1. a) $-\frac{5}{4}$ c) $-\frac{1}{4}$ e) $-\frac{3}{20}$ h) $\frac{32}{10}$

2 a) $\frac{7}{10}$ c) $-\frac{9}{16}$ e) $-\frac{7}{24}$

Decimals + 1) 7.9 2) 19.4 3) 1.02

- 1) 5.2 2) 3.5 3) 2.7

\times 1) 1.2 2) 12.0 3) 0.72

\div 1) 0.9 2) 3.2 3) 20.5