Name:_____

M8H HW CH2 Lesson Operations with Fractions 2025

1. When adding or subtracting two fractions, why do they need to have a common denominator first? Explain:

2. When multiplying or dividing fractions, do you need to have a common denominator first? Why or why not? Explain?

3. When dividing by a fraction, why do we flip the fraction and change the division operation to a multiplication operation? Explain:

4. When multiplying fractions, what does it mean to "Cancel Out" common factors? Explain:

5. When multiplying fractions, can you "cancel" out a common factor if both terms are in the numerator? Why or Why not? Explain.

6. What does it mean to find the reciprocal? What is the reciprocal of $\frac{a}{b}$?

7. What happens when you take a number to the power of -1? Suppose you have a fraction to the power of -1, what would it become?

8. Indicate the GCF between the numerator and denominator. Then reduce the fractions to lowest terms

a) $\frac{8}{12}$	b) $\frac{15}{25}$	c) $\frac{24}{36}$	d) $\frac{36}{63}$	e) $\frac{56}{49}$	f) $\frac{48}{84}$
g) $\frac{65}{117}$	h) $\frac{150}{105}$	i) $\frac{224}{36}$	j) $\frac{24}{96}$	k) $\frac{81}{135}$	L) $\frac{720}{1080}$
M) $\frac{a^5 b}{a^4 b^3}$	N) $\frac{8!}{2^9}$	O) $\frac{a^2 b^3 c}{a b^5 c^2}$	P) $\frac{3a+3b}{5a+5b}$	Q) $\frac{a^2-b^2}{2a+2b}$	R) $\frac{a-b}{b-a}$, $[a \neq b]$

9. Evaluate the following by adding or subtracting fractions

a) $\frac{5}{9}+\frac{40}{72}$	b) $\frac{3}{18}+\frac{25}{30}$	c) $\frac{10}{21}+\frac{22}{28}$
d) $1\frac{2}{5}+3\frac{2}{20}$	e) $1\frac{5}{17}-\frac{38}{51}$	f) $\frac{34}{39}-\frac{55}{78}$
g) $2\frac{1}{5}+3\frac{2}{4}-2\frac{7}{3}$	h) $-3\frac{1}{4}+3\frac{2}{3}+1\frac{1}{2}$	i) $4\frac{7}{8}-2\frac{9}{10}-2\frac{13}{20}$
j) $\frac{15}{14}\times\frac{21}{36}-\frac{2}{3}$	k) $\frac{35}{36}\div\frac{49}{48}-\frac{2}{7}$	L) $\frac{1}{3}-2\frac{2}{3}\times5\frac{1}{4}$
m) $\frac{5}{2}\times\frac{4}{15}+\frac{1}{2}$	n) $\frac{2}{3}+\frac{6}{7}\div\frac{18}{14}-\frac{1}{2}$	O) $\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}+\frac{1}{6}$

10. Evaluate the following by Multiply or Divide the following.

a) $\frac{12}{18}\times\frac{27}{15}$	b) $\frac{25}{24}\times\frac{16}{15}$	c) $\frac{10}{12}\div\frac{1}{3}$

d) $\frac{6}{7} \div \frac{3}{4}$	e) $4\frac{2}{3} \div 1\frac{2}{7}$	f) $\frac{16}{21} \div \frac{24}{35}$
g) $6\frac{3}{4} \div \frac{3}{16}$	h) $3\frac{1}{5} \times 6\frac{1}{4} \div 13\frac{1}{3}$	i) $\frac{26}{24} \times \frac{12}{14} \times \frac{56}{65}$
j) $\frac{25}{21} \times \frac{54}{11} \times \frac{28}{15} \times \frac{22}{18}$	k) $\frac{14}{27} \times \frac{18}{40} \times \frac{36}{15} \times \frac{32}{21}$	L) $\frac{16}{21} \times \frac{30}{24} \times \frac{27}{18} \div \frac{9}{14}$
m) $\frac{64}{9} \times \frac{27}{32} \times \frac{24}{45} \div \frac{48}{18}$	n) $16 \times \frac{22}{12} \times \frac{27}{25} \times \frac{15}{18}$	O) $\frac{1}{3} \div \frac{4}{27} \div \frac{16}{21}$
$1\frac{2}{3} \div 2\frac{3}{6} \div 6\frac{1}{4}$	$\frac{2}{3} \div 2\frac{3}{4} \div 7\frac{1}{3}$	$7\frac{3}{4} \div 5\frac{1}{3} \div 1\frac{1}{2}$

11. Simplify each of the following composite fractions. Reduce your answer to lowest form

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

d) $\dfrac{\frac{2}{3}\times\frac{6}{5}-\frac{1}{10}}{\frac{1}{5}+\frac{5}{2}}$	e) $\dfrac{\left(2\frac{1}{2}+3\frac{3}{4}\right)\times\frac{8}{50}}{\frac{2}{5}}$	f) $\dfrac{\frac{1}{2}+\left(\frac{3}{4}\div\frac{1}{2}\right)}{\left(\frac{1}{6}+\frac{2}{3}\right)\div\frac{3}{5}}$

12. Simplify each of the fractions to the given exponent. Reduce your answer to lowest form

a) $\left(\frac{2}{3}\right)^{-1}$	b) $\left(\frac{4}{5}\right)^{-1}$	c) $\left(\frac{5}{4}\right)^{-2}$
d) $\left(\frac{a^2}{b^3}\right)^{-1}$	e) $\left(\frac{a^2c^3}{b^2d}\right)^{-2}$	f) $\dfrac{2}{\frac{4}{7}}$
g) $\dfrac{1}{\frac{1}{\left(\frac{a}{b}\right)}}$	h) $\left(\dfrac{1}{\frac{1}{\frac{1}{\frac{a}{b}}}}\right)^{-2}$	i) $\dfrac{2}{\frac{4}{7}+\frac{1}{\frac{2}{3}+\frac{1}{2}}}$

Part 2 Applications of Fractions: For each of the following questions below, write out the mathematical operations required to solve the problem. Then solve the problem.

13. Albert spent 1/5 of his savings on a new computer. Later that week, he spent ½ of the rest on another desktop computer. What fraction of his original savings did he have left?

14. Jenny has a purse of coins. 3/7 of the coins are pennies. 1/8 of the other coins are quarters. If there are 15quarters, how many coins pennies does she have?

15. Shirley bought a bunch of donuts and left it in the common room. Mike arrives and eats 1/3 of all the donuts. Then Eva arrives and eats ¼ of what remained. If there was 3 donuts left, how many donuts did Shirley buy?

16. Rick has a string 60 meters. He cuts the string into pieces that are 2/3 of a meter long. How many pieces will he have?

17. Sally and her friends bought three pizzas, with eight slices each. One of the boys ate 3 slices and went home. They now need to split the rest of the pizza amongst six people. What fraction of a pizza does each person get?

18. Michael has a piece of tape $7\frac{4}{5}$ units long. If he cuts it into pieces each $\frac{3}{5}$ of a unit long, how many pieces will he have?

19. A cookie recipe requires $1\frac{2}{3}$ cups of flour to make 10 cookies. If Sarah has 18cups of flour, how many cookies can she make?

20. An earthquake in Japan was $2\frac{1}{2}$ times greater than the earthquake in Italy. Another earthquake in Chile was $11\frac{2}{3}$ greater than the earthquake in Italy. How many times greater was the earthquake in Chile compared to Japan?

21. A song on your iPhone is $3\frac{3}{4}$ minutes long. If you have $9\frac{2}{3}$ minutes, how many times can you listen to the song?

22. Jason needs $2\frac{1}{2}$ tanks of gas to drive from Vancouver to Portland. Each tank of gas will cost him $\$\frac{98}{3}$. How much will it cost him to drive from Vancouver to Portland?

23. The length of a box is increased by $1\frac{2}{3}$ times its original length and the width is increased by $2\frac{1}{5}$ times its original width. If the original area of the box is 300m^2, then what is the area of the new box?

24. Challenge: Sharon has some money in her pocket. Her friend Wendy has $1\frac{1}{2}$ times as much as Sharon. Another friend Chelsea has $1\frac{2}{3}$ times as much money as Wendy. Altogether they have $200. How much money does Sharon have?

25. Larry watched one television program for $\frac{1}{3}$ of an hour and then watched another program for 15 min. For what fraction of an hour did Larry watch television?

26. Keon baked a wild blueberry upside-down cobbler. Shawnie ate $\frac{1}{6}$ of the cobbler. Iris ate $\frac{1}{5}$ of what was left. Chan ate $\frac{1}{4}$ of what was left after that. Cami ate $\frac{1}{3}$ of what was left after that. Demi ate $\frac{1}{2}$ of what was left after that. How much of the original cobbler remained?

27. Challenge: Amy, Betty, and Graham ran for Student Council president. Amy won with $\frac{9}{20}$ of the votes, Betty got $\frac{2}{5}$, and Graham got $\frac{3}{20}$. If 20 people had switched their vote from Graham to Betty, then Betty would have ended up with 1 more vote than Amy. How many people voted?