MATHEMATICS
Grade 8
Number Sense and Numeration: Fractions and Rationals

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## Answers:

1. 

a. $\frac{3}{8}$
b. $\frac{1}{2}$
c. $\frac{11}{12}$
2.
a. $5 \frac{2}{3}$
b. $1 \frac{3}{4}$
3.
a. $3 \frac{1}{4}$
b. $1 \frac{1}{6}$
c. $-1 \frac{1}{2}$
4.
a. $\frac{23}{4}$
b. $\frac{23}{9}$
c. $-\frac{7}{5}$
5.
a. <
b. >
c. <
d. >
6. $-\frac{7}{8},-\frac{1}{2}, \frac{7}{12}, 1 \frac{1}{4}$
7. 9
8.
a. $\frac{25}{24}$
b. $\frac{11}{15}$
c. $\frac{11}{20}$
d. $\frac{17}{15}$
e. $-\frac{1}{3}$
f. $\frac{25}{9}$
g. $\frac{17}{20}$
h. $\frac{23}{35}$
9.
a. $\frac{6}{35}$
b. $\frac{21}{5}$
c. 112
d. $\frac{371}{40}$
e. $\frac{10}{7}$
f. $\frac{8}{9}$
g. $\frac{1}{3}$
h. $\frac{84}{25}$

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10.

11.
a. $\frac{3}{4}, \frac{3}{2}, \frac{9}{10}, \frac{1}{2}\left[\right.$ multiply each given quantity by $\left.\frac{3}{2}\right]$
b. $\frac{3}{8}, \frac{3}{4}, \frac{9}{20}, \frac{1}{4}$
12.
a. $\frac{2}{3}$
b. $6 \frac{2}{5}$
c. $3 \frac{1}{9}$
d. $\frac{2}{3}$
е. $7 \frac{7}{9}$
f. $\frac{13}{20}$
g. $\frac{13}{32}$
h. $16 \frac{2}{5}$
13. $(4444-444) \div 4 \times 4444 \div 4444$ Other answers are possible.
14. Lesley's sister and her mom receive $\frac{1}{4}+\frac{1}{4}=\frac{1}{2}$ of the pizza. Her father receives $\frac{1}{3}$ of the remaining $\frac{1}{2}$ which equals $\frac{1}{3} \times \frac{1}{2}=\frac{1}{6}$ of the pizza. This leaves Matt with $1-\frac{1}{2}-\frac{1}{6}=\frac{6-3-1}{6}=\frac{2}{6}=\frac{1}{3}$ of the pizza.

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15. $1+\frac{1}{1+\frac{1}{2}}=1+\frac{1}{\frac{3}{2}}=1+\frac{2}{3}=\frac{5}{3}$ Therefore, the reciprocal is $\frac{3}{5}$.
16. 11

The equation $11=1-\frac{1}{1-\frac{1}{1-\frac{1}{x}}}$ is true when $1-(-10)=11$, thus $-10=\frac{1}{1-\frac{1}{1-\frac{1}{x}}}$.
We know that $\frac{1}{-\frac{1}{10}}=-10$; so it follows that $-\frac{1}{10}=1-\frac{1}{1-\frac{1}{x}}$.
We know that $1-\frac{11}{10}=-\frac{1}{10}$; so it follows that $\frac{11}{10}=\frac{1}{1-\frac{1}{x}}$.
We know that $1-\frac{1}{11}=\frac{10}{11}$; so it follows that $\frac{1}{11}=\frac{1}{x}$.
We conclude that $x$ equals 11 .
Alternatively,
The following algebraic solution could be given after the study of solving linear equations.

$$
\left.\begin{array}{l}
11=1-\frac{1}{1-\frac{1}{1-\frac{1}{x}}} \\
11=1-\frac{1}{1-\frac{x}{x-1}} \\
11=1-\frac{1}{\frac{x-1}{x-1}-\frac{x}{x-1}}
\end{array}\right\} \begin{aligned}
& 11=1-\frac{x-1}{-1} \\
& 11=1+x-1 \\
& 11=x
\end{aligned}
$$

