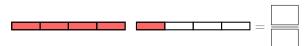
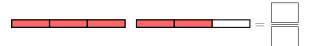
## **A DEFINITIONS**

## A.1 FINDING FRACTIONS

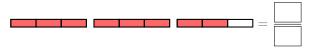
**Ex 1:** A bar represents 1. Find the fraction that represents the shaded part:



**Ex 2:** A bar represents 1. Find the fraction that represents the shaded part:



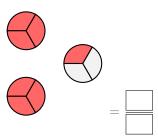
**Ex 3:** A bar represents 1. Find the fraction that represents the shaded part:



**Ex 4:** A circle represents 1. Find the fraction that represents the shaded part:

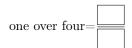


**Ex 5:** A circle represents 1. Find the fraction that represents the shaded part:



## A.2 WRITING FRACTIONS FROM WORDS

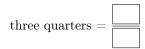
**Ex 6:** Write as fraction:



Ex 7: Write as fraction:



Ex 8: Write as fraction:



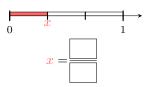
**Ex 9:** Write as fraction:



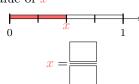
## **B ON THE NUMBER LINE**

# B.1 FINDING FRACTIONS WITH BAR FRACTION MODEL

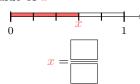
**Ex 10:** Find the value of x



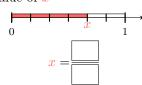
**Ex 11:** Find the value of x



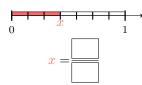
**Ex 12:** Find the value of x



**Ex 13:** Find the value of x

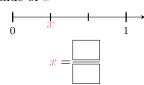


**Ex 14:** Find the value of x

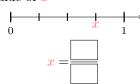


### **B.2 FINDING FRACTIONS**

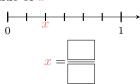
**Ex 15:** Find the value of x



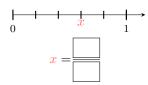
**Ex 16:** Find the value of x



**Ex 17:** Find the value of x

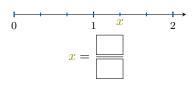


**Ex 18:** Find the value of x

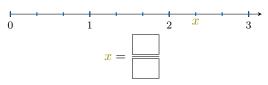


## **B.3 FINDING FRACTIONS GREATER THAN 1**

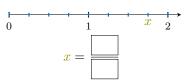
**Ex 19:** Find the value of x



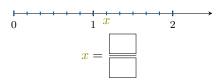
**Ex 20:** Find the value of x



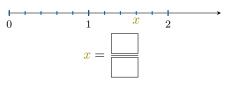
**Ex 21:** Find the value of x



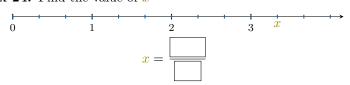
**Ex 22:** Find the value of x



**Ex 23:** Find the value of x



**Ex 24:** Find the value of x



# C EQUIVALENT FRACTIONS

## **C.1 FINDING THE MISSING NUMERATOR**

Ex 25:

$$\frac{2}{4} = \boxed{\frac{2}{2}}$$

Ex 26:

$$\frac{9}{6} = \boxed{\frac{2}{2}}$$

Ex 27:

$$\frac{5}{10} = \boxed{\frac{2}{2}}$$

Ex 28:

$$\frac{16}{12} = \frac{}{3}$$

Ex 29:

$$\frac{4}{10} = \frac{5}{5}$$

# C.2 FINDING THE MISSING NUMERATOR

Ex 30:

$$\frac{1}{2} = \boxed{\frac{1}{4}}$$

Ex 31:

$$\frac{4}{3} = \boxed{15}$$

Ex 32:

$$\frac{3}{4} = \frac{12}{12}$$

Ex 33:

$$\frac{5}{6} = \frac{12}{12}$$

Ex 34:

$$\frac{7}{8} = \boxed{\frac{32}{32}}$$

#### **C.3 FINDING THE MISSING DENOMINATOR**

Ex 35:

$$\frac{4}{10} = \frac{2}{10}$$

Ex 36:

$$\frac{6}{12} = \frac{1}{12}$$

Ex 37:

$$\frac{9}{6} = \frac{3}{6}$$

Ex 38:

$$\frac{12}{10} = \frac{6}{\boxed{\phantom{0}}}$$

## C.4 FINDING THE MISSING DENOMINATOR

## Ex 39:

$$\frac{2}{5} = \frac{6}{}$$

### Ex 40:

$$\frac{2}{3} = \frac{8}{}$$

### Ex 41:

$$\frac{3}{5} = \frac{9}{}$$

#### Ex 42:

$$\frac{4}{7} = \frac{12}{7}$$

### Ex 43:

$$\frac{5}{9} = \frac{20}{}$$

## **D.2 SIMPLIFYING FRACTIONS**

### Ex 48: Simplify:

$$\frac{4}{6} = \boxed{\phantom{0}}$$

### Ex 49: Simplify:

$$\frac{24}{16} = \boxed{ }$$

## Ex 50: Simplify:

$$\frac{12}{20} = \boxed{ }$$

### Ex 51: Simplify:

$$\frac{30}{100} = \boxed{\phantom{0}}$$

## Ex 52: Simplify:

$$\frac{25}{100} = \boxed{ }$$

## **D SIMPLIFICATION**

### **D.1 SIMPLIFYING FRACTIONS**

### Ex 44: Simplify:

$$\frac{4}{6} = \boxed{\phantom{0}}$$

## Ex 45: Simplify:

$$\frac{2}{4} = \boxed{\phantom{0}}$$

## Ex 46: Simplify:

$$\frac{10}{8} = \boxed{\phantom{0}}$$

#### Ex 47: Simplify:

$$\frac{6}{9} = \boxed{\phantom{0}}$$

# **E CROSS MULTIPLICATION**

# E.1 SOLVING PROPORTIONS USING CROSS-MULTIPLICATION

**Ex 53:** Solve 
$$x$$
 for  $\frac{12}{4} = \frac{x}{6}$ :

$$r =$$

**Ex 54:** Solve 
$$x$$
 for  $\frac{11}{10} = \frac{x}{5}$ :

$$x =$$

**Ex 55:** Solve 
$$x$$
 for  $\frac{12}{10} = \frac{18}{x}$ :

$$x = \boxed{\phantom{a}}$$

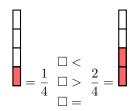
**Ex 56:** Solve 
$$x$$
 for  $\frac{27}{x} = \frac{30}{10}$ :

$$x = \boxed{\phantom{a}}$$

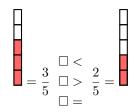
# F ORDERING FRACTIONS

# F.1 COMPARING WITH SAME DENOMINATOR WITH BAR MODELS

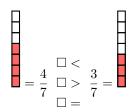
Ex 57: Compare using >, <, =:



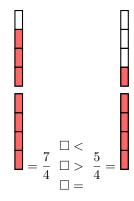
**Ex 58:** Compare using >, <, =:



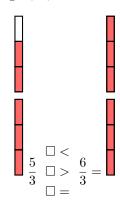
Ex 59: Compare using >, <, =:



Ex 60: Compare using >, <, =:



**Ex 61:** Compare using >, <, =:



#### F.2 COMPARING WITH SAME DENOMINATOR

Ex 62: Compare using >, <, =:

$$\begin{array}{c} \square < \\ \frac{7}{3} \square > \frac{6}{3} \\ \square = \end{array}$$

**Ex 63:** Compare using >, <, =:

$$\begin{array}{ccc}
 & \square < \\
 & 5 \\
\hline
4 & \square > \frac{3}{4}
\end{array}$$

Ex 64: Compare using >, <, =:

$$\begin{array}{c} \square < \\ \frac{2}{6} \square > \frac{4}{6} \\ \square = \end{array}$$

**Ex 65:** Compare using >, <, =:

$$\begin{array}{c}
\square < \\
\frac{7}{5} \square > \frac{3}{5} \\
\square = 
\end{array}$$

Ex 66: Compare using >, <, =:

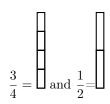
$$\begin{array}{ccc}
3 & \square < & 6\\
8 & \square > & 8\\
\square = & \end{array}$$

# F.3 COMPARING FRACTIONS WITH DIFFERENT DENOMINATORS

Ex 67: Compare using >, <, =:

$$\begin{array}{c} \square < \\ \frac{3}{4} \square > \frac{1}{2} \end{array}$$

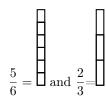
Hint: color the bars below to help you compare the fractions.



Ex 68: Compare using >, <, =:

$$\begin{array}{c} \square < \\ \frac{5}{6} \square > \frac{2}{3} \end{array}$$

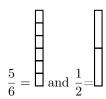
Hint: color the bars below to help you compare the fractions.



Ex 69: Compare using >, <, =:

$$\begin{array}{c}
\square < \\
\frac{5}{6} \square > \frac{1}{2} \\
\square = 
\end{array}$$

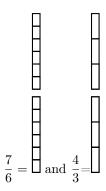
Hint: color the bars below to help you compare the fractions.



Ex 70: Compare using >, <, =:

$$\begin{array}{ccc}
 & \square < \\
 & 7 & \square > \frac{4}{3} \\
 & \square = 
\end{array}$$

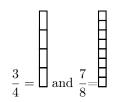
Hint: color the bars below to help you compare the fractions.



Ex 71: Compare using >, <, =:

$$\begin{array}{c} \square < \\ \frac{3}{4} \square > \frac{7}{8} \\ \square = \end{array}$$

Hint: color the bars below to help you compare the fractions.



# F.4 COMPARING FRACTIONS TO REAL-WORLD PROBLEMS

MCQ 72: Hugo spends  $\frac{3}{8}$  of his money on Pokemon cards and  $\frac{1}{4}$  of his money to buy a tennis racket. On which does he spend more money?

- □ Pokemon cards
- ☐ Tennis racquet

MCQ 73: Sophie spends  $\frac{1}{2}$  of her money on clothes and  $\frac{3}{8}$  of her money on books. On which does she spend more money?

- □ Clothes
- □ Books

MCQ 74: For her cake recipe, Sarah uses  $\frac{2}{5}$  of a cup of butter and  $\frac{3}{10}$  of a cup of sugar. Which ingredient does she use more of?

- □ Butter
- □ Sugar

MCQ 75: In Class A,  $\frac{6}{10}$  of the students are girls, and in Class B,  $\frac{13}{20}$  of the students are girls. In which class is the proportion of girls higher?

- □ Class A
- □ Class B

# F.5 COMPARING FRACTIONS WITH UNLIKE DENOMINATORS

Ex 76:

$$\begin{array}{c} \square < \\ \frac{3}{4} \square > \frac{5}{6} \end{array}$$

Ex 77:

Ex 78:

$$\begin{array}{c} \square < \\ \frac{4}{5} \square > \\ \boxed{2} \end{array}$$

Ex 79:

$$\begin{array}{c}
\square < \\
\frac{2}{3} \square > \frac{3}{4} \\
\square = 
\end{array}$$

# G ADDITION AND SUBTRACTION WITH COMMON DENOMINATORS

# G.1 ADDING FRACTIONS WITH COMMON DENOMINATORS

Ex 80:

$$\frac{1}{4} + \frac{2}{4} =$$

Ex 81:

$$\frac{3}{5} + \frac{1}{5} =$$

Ex 82:

$$\frac{2}{6} + \frac{3}{6} =$$

$$\frac{2}{3} + \frac{1}{6} = \boxed{\phantom{0}}$$

Ex 83:

$$\frac{2}{3} + \frac{2}{3} =$$

Ex 93:

$$\frac{3}{5} + \frac{2}{15} = \boxed{ }$$

Ex 84:

$$\frac{4}{5} + \frac{2}{5} = \boxed{\boxed{}}$$

Ex 94:

$$\frac{3}{10} + \frac{2}{5} = \boxed{}$$

G.2 SUBTRACTING FRACTIONS WITH COMMON **DENOMINATORS** 

$$\frac{3}{4} - \frac{2}{4} = \boxed{\boxed{}}$$

Ex 95:

$$\frac{3}{8} + \frac{1}{2} =$$

**H.2 SUBTRACTING FRACTIONS** 

Ex 86:

$$\frac{4}{5} - \frac{3}{5} = \boxed{\boxed{}}$$

Ex 96:

$$\frac{2}{5} - \frac{3}{10} = \boxed{ }$$

Ex 87:

$$\frac{3}{4} - \frac{1}{4} = \boxed{\phantom{1}}$$

Ex 97:

$$\frac{7}{6} - \frac{1}{3} = \boxed{\boxed{\phantom{0}}} - \boxed{\boxed{\phantom{0}}}$$
$$= \boxed{\boxed{\phantom{0}}}$$

Ex 88:

$$\frac{4}{3} - \frac{2}{3} =$$

Ex 98:

$$\frac{7}{8} - \frac{3}{4} = \boxed{\boxed{\phantom{0}}} - \boxed{\boxed{\phantom{0}}}$$
$$= \boxed{\boxed{\phantom{0}}}$$

Ex 89:

$$\frac{7}{6} - \frac{2}{6} = \boxed{\phantom{0}}$$

H ADDITION AND SUBTRACTION WITH Ex 99:

$$\frac{5}{3} - \frac{5}{9} = \boxed{ }$$

# **H.1 ADDING FRACTIONS**

**DIFFERENT DENOMINATORS** 

Ex 90:

$$\frac{2}{5} + \frac{3}{10} = \boxed{\phantom{0}}$$

Ex 100:

$$\frac{7}{2} - \frac{7}{4} = \boxed{ }$$

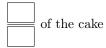
Ex 91:

$$\frac{1}{4} + \frac{3}{8} = \boxed{ }$$

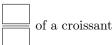
Ex 92:

### H.3 SOLVING REAL-WORLD PROBLEMS

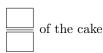
Ex 101: Louis has a whole cake. He cuts it into 8 equal slices and eats 3 slices. What fraction of the whole cake remains?



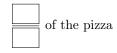
**Ex 102:** Today, Louis eats  $\frac{1}{2}$  of a croissant. Then, Louis eats  $\frac{1}{4}$  of another croissant. How much croissant did Louis eat in total?



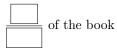
**Ex 103:** At the beginning, there are  $\frac{5}{6}$  of a cake. After eating, there are  $\frac{2}{3}$  of the cake. What quantity of cake did Louis eat?



**Ex 104:** At the beginning, there are  $\frac{7}{8}$  of a pizza. After eating, there are  $\frac{3}{4}$  of the pizza. What quantity of pizza did Louis eat?



**Ex 105:** Louis read  $\frac{2}{5}$  of his book on Saturday and  $\frac{3}{10}$  of his book on Sunday. How much of his book did Louis read in total?



# H.4 ADDING FRACTIONS WITH UNLIKE DENOMINATORS

Ex 106: Calculate and simplify:

$$\frac{2}{3} + \frac{3}{5} =$$

Ex 107: Calculate and simplify:

$$\frac{1}{2} + \frac{2}{3} =$$

Ex 108: Calculate and simplify:

$$\frac{3}{2} + \frac{4}{5} =$$

Ex 109: Calculate and simplify:

$$\frac{3}{4} + \frac{5}{6} =$$

Ex 110: Calculate and simplify:

$$\frac{7}{8} + \frac{11}{6} = \boxed{\phantom{0}}$$

## I FRACTION AS QUOTIENT

### **I.1 CONVERTING DIVISION TO FRACTIONS**

Ex 111: Write as a fraction:

$$3 \div 2 =$$

Ex 112: Write as a fraction:

$$2 \div 5 =$$

Ex 113: Write as a fraction:

$$3 \div 4 = \boxed{ }$$

Ex 114: Write as a fraction:

$$5 \div 3 =$$

# I.2 CONVERTING FRACTIONS TO DIVISION EXPRESSIONS

Ex 115: Convert the fraction into a division expression:

$$\frac{2}{5} = \boxed{\phantom{0}} \div \boxed{\phantom{0}}$$

Ex 116: Convert the fraction into a division expression:

$$\frac{4}{7} = \boxed{\phantom{1}} \div \boxed{\phantom{1}}$$

Ex 117: Convert the fraction into a division expression:

$$\frac{3}{8} = \boxed{\phantom{1}} \div \boxed{\phantom{1}}$$

Ex 118: Convert the fraction into a division expression:

$$\frac{6}{9} = \boxed{\phantom{0}} \div \boxed{\phantom{0}}$$

#### 1.3 CONVERTING FRACTIONS TO WHOLE NUMBERS

Ex 119: Convert the fraction into a whole number:

$$\frac{4}{2} = \boxed{\phantom{0}}$$

Ex 120: Convert the fraction into a whole number:

$$\frac{9}{3} =$$

Ex 121: Convert the fraction into a whole number:

$$\frac{8}{4} =$$

Ex 122: Convert the fraction into a whole number:

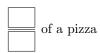
$$\frac{5}{5} = \boxed{\phantom{0}}$$

#### **I.4 FINDING FRACTIONS IN WORD PROBLEMS**

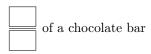
**Ex 123:** Four friends share 3 cakes equally. What fraction does each friend get?



**Ex 124:** Five friends share 2 pizzas equally. What fraction does each friend get?



**Ex 125:** A couple shares 5 chocolate bars equally. What fraction of a chocolate bar does each person get?



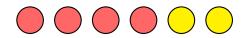
**Ex 126:** Six family members share 2 apple pies equally. What fraction of a pie does each family member get?



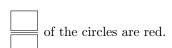
## J FRACTION AS RATIO

J.1 IDENTIFYING FRACTIONS IN REAL-LIFE CONTEXTS

Ex 127:



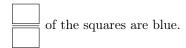
What fraction of the circles are red?



Ex 128:



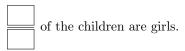
What fraction of the squares are blue?



Ex 129:



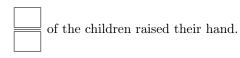
What fraction of the children are girls?



Ex 130:

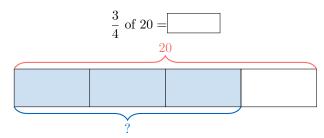


What fraction of the children raised their hand?

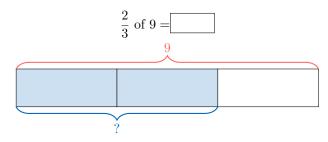


#### J.2 CALCULATING FRACTIONS OF A WHOLE

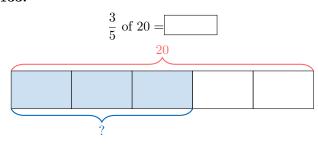
Ex 131:



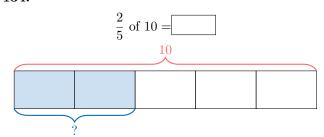
Ex 132:



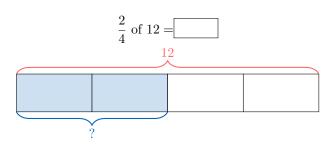
Ex 133:



Ex 134:



Ex 135:



# J.3 APPLYING FRACTIONS TO REAL-WORLD PROBLEMS

**Ex 136:** In a class of 9 students,  $\frac{2}{3}$  of the students are girls. How many of the students are girls?

girls

**Ex 137:** In a group of 16 fruits,  $\frac{3}{4}$  of them are apples. How many of the fruits are apples?

apples

**Ex 138:** In a collection of 15 books,  $\frac{2}{5}$  of them are novels. How many of the books are novels?

novels

**Ex 139:** For a refreshing drink recipe, the mixture consists of  $\frac{1}{3}$  lemon and  $\frac{2}{3}$  water for a total of 18 cl. How much lemon and water are used in the drink?

cl of lemon

## K FRACTION AS DECIMAL NUMBER

## K.1 CONVERTING FRACTIONS TO DECIMALS

Ex 140: Convert to a decimal number:

 $\frac{3}{4} = \boxed{\phantom{1}}$ 

Ex 141: Convert to a decimal number:

 $\frac{2}{5} = \boxed{\phantom{0}}$ 

Ex 142: Convert to a decimal number:

 $\frac{3}{20} =$ 

Ex 143: Convert to a decimal number:

 $\frac{40}{50} =$ 

#### **K.2 CONVERTING DECIMALS TO FRACTIONS**

Ex 144: Convert to a fraction:

Ex 145: Convert 0.3 to a fraction:

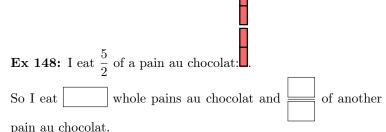
Ex 146: Convert 10.7 to a fraction:

Ex 147: Convert 0.99 to a fraction:

$$0.99 = \frac{}{}$$

# L PROPER AND IMPROPER FRACTIONS

### L.1 SOLVING REAL-WORLD PROBLEMS



**Ex 149:** I eat  $\frac{5}{4}$  of a pizza:

So I eat \_\_\_\_\_ of another pizza.

**Ex 150:** I have  $\frac{8}{6}$  of a ribbon:

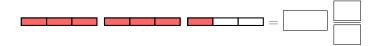
So I have whole ribbon and of another ribbon.

**Ex 151:** I have  $\frac{10}{3}$  of a wood plank:

So I have [	whole wood planks and	of another wood
plank.		

# L.2 FINDING MIXED NUMBERS FROM BAR MODELS

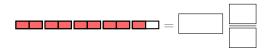
Ex 152: Write the mixed number shown in the diagram:



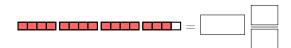
Ex 153: Write the mixed number shown in the diagram:



 $\mathbf{Ex}\ \mathbf{154:}\ \mathbf{Write}$  the mixed number shown in the diagram:



Ex 155: Write the mixed number shown in the diagram:



Ex 156: Write the mixed number shown in the diagram:



## L.3 FINDING FRACTIONS FROM MIXED NUMBERS

Ex 157: Convert into improper fraction:

$$2\frac{1}{3} = \boxed{\boxed{}}$$

Ex 158: Convert into an improper fraction:

$$3\frac{2}{5} = \boxed{\phantom{0}}$$

Ex 159: Convert into an improper fraction:

$$2\frac{3}{4} = \boxed{ }$$

Ex 160: Convert into an improper fraction:

$$4\frac{1}{2} = \boxed{ }$$

#### L.4 FINDING MIXED NUMBERS FROM FRACTIONS

Ex 161: Convert into mixed number:

$$\frac{3}{2} = \square$$

Ex 162: Convert into a mixed number:

$$\frac{7}{3} = \square$$

Ex 163: Convert into a mixed number:

$$\frac{9}{2} = \boxed{\phantom{0}}$$

Ex 164: Convert into a mixed number:

$$\frac{13}{5} = \boxed{ }$$