

Year 7 Term 2 Homework

Student Name: _____	Grade: _____
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1 Year 7 Term 2 Week 1 Homework

1.1 Fractions

1.1.1 The Definition of a Fraction

- the number above the dividing line is called the numerator.
- the number below the line is called denominator.
- the dividing line in a fraction is called the vinculum.

Exercise 1.1.1

1. How many sixths are there in 2 wholes? _____
2. How many eighths are there in 4 wholes? _____
3. How many quarters are there in 3 wholes? _____
4. Mary cut her apple into quarters and then cut each quarter into three equal pieces. If Mary eats eight of the small pieces, what fraction of the apple will remain?

5. Tony bought a pizza and ate half of it. His sister Linda ate one-third of the remainder. What fraction of the pizza is left over?

6. Express 2.68 as mixed number in its simplest form. _____

7. What fraction of the figure has been shaded? _____



8. A bag contains 5 red, 4 green and 2 yellow discs. What fraction of the discs are green?

1.1.2 Proper Fractions

If the numerator in a fraction is less than the denominator, then the fraction is a **proper fraction**.

Exercise 1.1.2

1. $\frac{2}{3} + \frac{2}{5} =$ _____

2. $\frac{2}{3} - \frac{2}{5} =$ _____

3. $\frac{2}{3} \times \frac{2}{5} =$ _____

4. $\frac{2}{3} \div \frac{2}{5} =$ _____

1.1.3 Improper Fractions

In a fraction, if the numerator is greater than or equal to the denominator then the fraction is called an **improper fraction**.

Exercise 1.1.3

1. $\frac{3}{2} + \frac{5}{2} =$ _____

2. $\frac{3}{2} - \frac{5}{2} =$ _____

3. $\frac{3}{2} \times \frac{5}{2} =$ _____

4. $\frac{3}{2} \div \frac{5}{2} =$ _____

5. $\frac{9}{2} + 4 =$ _____

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

7. $\frac{9}{2} \times 4 =$ _____

8. $\frac{9}{2} \div 4 =$ _____

1.1.4 Mixed Numerals

To convert a mixed numeral to an improper fraction:

- Multiply the denominator by the whole number then add the numerator.
- keep the same denominator.

To convert an improper fraction to a mixed numeral:

- divide the numerator by the denominator
- write the remainder over the same denominator.

Exercise 1.1.4 Express each of following mixed numerals fractions as improper fractions:

1. $4\frac{3}{7} =$ _____

2. $7\frac{2}{5} =$ _____

3. $12\frac{1}{3} =$ _____

Exercise 1.1.5 Express each of following improper fractions as a mixed numeral:

1. $\frac{23}{5} =$ _____

2. $\frac{37}{7} =$ _____

3. $\frac{64}{8} =$ _____

Exercise 1.1.6 Evaluate the following fractions:

1. $3\frac{2}{3} + 2\frac{2}{5} =$ _____

2. $3\frac{2}{3} - 2\frac{2}{5} =$ _____

3. $3\frac{2}{3} \times 2\frac{2}{5} =$ _____

4. $3\frac{2}{3} \div 2\frac{2}{5} =$ _____

5. $3\frac{2}{3} \times 6 =$ _____

6. $3\frac{2}{3} \div 6 =$ _____

1.1.5 Equivalent Fractions

If two or more fractions have the same value, then they are called **equivalent fractions**. To find a fraction which is equivalent to a given fraction, multiply the numerators and denominators by the same number.

Example 1.1.1 Complete each of the following equivalent fractions:

$$\text{a } \frac{1}{4} = \frac{\square}{12}$$

$$\text{b } \frac{2}{3} = \frac{\square}{15}$$

Solution:

$$\text{a } \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$$

$$\text{b } \frac{2 \times 5}{3 \times 5} = \frac{10}{15}$$

Exercise 1.1.7 Complete each of these equivalent fractions:

$$1. \text{ a. } \frac{2}{3} = \frac{\square}{12}$$

$$\text{b. } \frac{3}{7} = \frac{\square}{21}$$

$$\text{c. } \frac{11}{12} = \frac{\square}{60}$$

$$2. \text{ a. } \frac{7}{\square} = \frac{28}{36}$$

$$\text{b. } \frac{\square}{7} = \frac{12}{21}$$

$$\text{c. } \frac{5}{\square} = \frac{15}{18}$$

$$3. \text{ a. } 1\frac{5}{6} = \frac{\square}{24}$$

$$\text{b. } 4\frac{1}{4} = \frac{\square}{12}$$

$$\text{c. } 2\frac{2}{3} = \frac{\square}{24}$$

$$4. \text{ a. } \frac{2}{5} = \frac{6}{\square} = \frac{\square}{25} = \frac{16}{\square}$$

$$\text{b. } \frac{3}{8} = \frac{6}{\square} = \frac{\square}{24} = \frac{18}{\square}$$

1.1.6 Simplifying Fractions

To simplify a fraction:

- find the highest common factor (HCF) of the numerator and denominator.
- divide both the numerator and denominator by this HCF.

Exercise 1.1.8 Simplify the following fractions:

$$1. \frac{36}{45} = \underline{\hspace{15em}}$$

$$2. \frac{36}{81} = \underline{\hspace{15em}}$$

$$3. \frac{121}{132} = \underline{\hspace{15em}}$$

1.1.7 Problem Solving**Exercise 1.1.9**

1. A box contains 36 similar books. The total mass of the box together with $\frac{3}{4}$ of the books is 11.25 kg lighter than of the box with all the books. The mass of each book is $\frac{5}{7}$ times the mass of the box. What is the total mass of the box with all its contents?

2. A box contains 25 similar reams of photocopy paper. The total mass of the box together with $\frac{2}{5}$ of the papers is 36 kg lighter than the box with all its contents. The mass of the box is $\frac{3}{5}$ times that of a ream of paper. What is the total mass of the box with all its contents?

3. The total mass of a box with $\frac{3}{4}$ of its contents is 7.36 kg lighter than when it is full. The box contained 16 similar paper weights each with mass $\frac{1}{4}$ times the mass of the box. What is the total mass of the box with all its contents?

1.2 Maths Challenge

Exercise 1.2.1

1. Four of the following are equal. Which is the odd one out?

(A) $\frac{1}{3} + \frac{5}{7}$

(B) 0.6

(C) $\frac{15}{25}$

(D) 60%

(E) $\frac{1}{2} + \frac{1}{10}$

2. Nine bus stops are equally spaced along a bus route. The distance from the first to the third is 700 m. How far is it from the first to the last?

3. How many of these statements are true? _____

(i) $12 \div \frac{1}{2} = 6$

(ii) $0.3 = 3\%$

(iii) $\frac{1}{7} < \frac{1}{9}$

(iv) $0.2 \times 0.4 = 0.8$

(v) $1\frac{2}{5} = \frac{21}{15}$

4. Judy and May had a total of 720 stamps. Judy gave $\frac{1}{3}$ of her stamps to May. May then gave $\frac{2}{5}$ of the total number of stamps she had to Judy. In the end, each girl had the same number of stamps. How many stamps had each of them at first?

5. If a , b and c are positive integers such that $a + \frac{1}{b+\frac{1}{c}} = \frac{37}{16}$, what is the sum of a , b and c ?

1.3 Miscellaneous Exercises

Exercise 1.3.1

1. Simplify $\frac{4\frac{1}{2} + \frac{2}{3}}{\frac{8}{13} \times 4\frac{1}{3}}$

2. Express $\frac{7-1\frac{2}{3}}{2-1\frac{5}{9}}$ as a single fraction in its lowest terms.

3. Evaluate the following, giving your answers in their simplest form:

(a) $(2\frac{1}{8} + 3\frac{1}{2}) \div \frac{1}{4}$

(b) $2 \times \frac{22}{7} \times \frac{21}{8}$

(c) $\frac{6\frac{1}{4} \div 3\frac{1}{2}}{5\frac{1}{4} \div 1\frac{1}{6}}$

Exercise 1.3.2

1. Find the number halfway between $\frac{1}{4}$ and $\frac{1}{16}$

2. If $\frac{n}{24}$ lies between $\frac{1}{4}$ and $\frac{1}{8}$ and n is an integer, what is the value of n ?

3. What value can replace the square to make the value of $\frac{\square}{8}$ between 6 and 7?

4. Evaluate the following:

(a) $1 + \frac{1}{2 + \frac{1}{4}}$

(b) $\frac{3^2 + 3^2 + 3^2}{2^3 + 2^3 + 2^3}$

(c) $1 - \left(\frac{3}{4}\right)^3$

Exercise 1.3.3 Problem solving involve fractions

1. When David making his milkshake, he uses 3 times as much ice-cream as syrup and $7\frac{1}{2}$ times as much milk as syrup. In his milkshake, how many times as much milk as ice-cream does he have?

2. Mike's weight one year ago was $\frac{3}{4}$ of his present weight. If he put on 12 kg in this year, what is his weight now?

3. Linda buys 16 kg of rice at a certain price. She finds that if she buys some cheaper rice costing 25 ¢ less per kilogram, she can buy $2\frac{1}{2}$ kg more for the same amount of money. What is the price per kg of the cheaper rice?

4. The difference between a positive fraction and its reciprocal is $\frac{9}{20}$. What is the sum of the fraction and its reciprocal?

5. A man cycles for some distance at 15 km/h and another of the same distance at 13 km/h. The total time taken is $5\frac{3}{5}$ hours. What distance did the man travel?

Exercise 1.3.4

1. A driver took $3\frac{1}{2}$ hours to travel 220 km. He drove part of the distance at a uniform speed of 52 km/h and part of the distance at 72 km/h.

(a) What is the distance he travelled at 52 km/h?

(b) How much time did he take to cover the distance at 72 km/h?

2. The fraction $\frac{1}{6}$ is tripled by adding the same number to both numerator and denominator. What is the number?

3. $\frac{3}{4}$ of a number is 24. What is $\frac{7}{2}$ of the number?

4. The interior angle of a quadrilateral are in the ratio 1 : 2 : 3 : 4. What is the value of the largest exterior angle?

5. A clumsy painter is engaged to paint an office. He spills $\frac{1}{10}$ of every can of paint he opens. 64.8 litres of paint are required to paint the office. If each can contains 4.8 litres of paint, calculate how many cans of paint are required.
