Sample Exam 8: Fractions Worksheet – Solutions

Session 8   **Total: 52 marks**

1. Three mixed numbers from the set below will produce a WHOLE number when added.

$3\frac{1}{4}$	$2\frac{2}{3}$	$1\frac{1}{6}$	$2\frac{1}{12}$

What are the three numbers?   [2]

Looking at the fraction part of the numbers:

$\frac{1}{4}$, $\frac{2}{3}$, $\frac{1}{6}$, $\frac{1}{12}$

These fractions are equivalent to:

$\frac{3}{12}$, $\frac{8}{12}$, $\frac{2}{12}$, $\frac{1}{12}$ respectively.

Looking at the numerators, the three numbers that add to give 12 are 3, 8 and 1.

Therefore,

$$3\frac{1}{4} + 2\frac{2}{3} + 2\frac{1}{12} = 3 + 2 + 2 + \frac{1}{4} + \frac{2}{3} + \frac{1}{12}$$

$$= 3 + 2 + 2 + \frac{3}{12} + \frac{8}{12} + \frac{1}{12}$$

$$= 3 + 2 + 2 + \frac{12}{12}$$

$$= 3 + 2 + 2 + 1$$

$$= 8$$

Answer_____ $3\frac{1}{4}$, $2\frac{2}{3}$, $2\frac{1}{12}$ _____

2. A small barrel holds $24\frac{5}{6}$ litres of water. Maria uses $13\frac{1}{4}$ litres to wash clothes and $5\frac{1}{2}$ litres to prepare food. How much water is left in the small barrel? [2]

Amount of water used $= 13\frac{1}{4} + 5\frac{1}{2}$

$$= 13 + 5 + \frac{1}{4} + \frac{1}{2}$$

$$= 18 + \frac{1}{4} + \frac{2}{4}$$

$$= 18 + \frac{3}{4}$$

$$= 18\frac{3}{4} \text{ litres}$$

Amount of water left in small barrel $= 24\frac{5}{6} - 18\frac{3}{4}$

Now, $24 - 18 = 6$

And $\frac{5}{6} - \frac{3}{4} = \frac{10}{12} - \frac{9}{12}$

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

So, the amount of water left in small barrel $= 6 + \frac{1}{12}$

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

Answer_____ $6\frac{1}{12}$ _____ litres

3. (a) Write in the box below the sign, $>$ or $<$, that CORRECTLY completes the number sentence.

$$\frac{2}{3} \quad \boxed{>} \quad \frac{5}{7}$$

$$\frac{2}{3} = \frac{14}{21}$$

$$\frac{5}{7} = \frac{15}{21}$$

Since $15 > 14$, then $\frac{5}{7} > \frac{2}{3}$.

(b) Find the difference between $\frac{2}{3}$ and $\frac{5}{7}$. [3]

$$\text{Difference} = \frac{5}{7} - \frac{2}{3}$$

$$= \frac{15}{21} - \frac{14}{21}$$

$$= \frac{1}{21}$$

Answer_____$\frac{1}{21}$_____

4. Three fifths of a number is 48. What is $\frac{3}{8}$ of the same number? [2]

$\frac{3}{5}$ of a number is 48.

Whole number $= \frac{5}{3} \times \frac{48}{1}$

$= 80$

Now,

$\frac{3}{8} \times 80 = \frac{3}{8} \times \frac{80}{1}$

$\frac{3}{8} \times 80 = 30$

Answer_____ 30 _____

5. Anthony had a piece of wire that was $12\frac{1}{3}$ m long. He used $7\frac{5}{6}$ m of it to fence the rose garden. What is the length of the remaining piece of wire? [2]

Length of remaining piece of wire $= 12\frac{1}{3} - 7\frac{5}{6}$

Whole Numbers

$= 12 - 7$

$= 5$

$= 4$

1

Fractions

$= \frac{1}{3} - \frac{5}{6}$

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

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

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

$= \frac{8}{6} - \frac{5}{6}$

$= \frac{3}{6}$

$= \frac{1}{2}$

Length of remaining piece of wire $= 4 + \frac{1}{2}$

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

Answer_____ $4\frac{1}{2}$ _____ m

6. The product of two numbers is 8. One of them is $3\frac{5}{9}$.

What is the other number? [3]

The product of two numbers $= 8$

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

$\qquad = \frac{32}{9}$

The other number $= 8 \div \frac{32}{9}$

$\qquad\qquad = 8 \times \frac{9}{32}$

$\qquad\qquad = \frac{9}{4}$

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

Answer_____ $2\frac{1}{4}$_____

7. Duliana's weekly allowance is \$96. She spent $\frac{1}{3}$ of it on snacks, $\frac{1}{4}$ of it on hair ribbons and saved the remainder.

(a) What fraction did she spend on snacks and hair ribbons together? [1]

Fraction of money spent $= \frac{1}{3} + \frac{1}{4}$

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

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

Answer_____$\frac{7}{12}$_____

(b) How much money did she save? [1]

Fraction of money saved $= 1 - \frac{7}{12}$

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

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

Amount of money saved $= \frac{5}{12} \times 96$

$$= \$40$$

Answer \$_____ 40 _____

8. A café cuts 12 cakes into NINTHS. Kiemora gets $\frac{1}{3}$ of ONE cake.

(a) How many NINTHS of cake does she get? [1]

$\frac{1}{3} = \frac{3}{9}$

Answer_____ 3 _____ ninths of cake

(b) How many NINTHS of cake does the café have remaining? [2]

12 cakes $= 12 \times 9$

$= 108$ ninths

Kiemora received 3 ninths of cake.

Number of ninths of cake remaining $= 108 - 3$

$= 105$

Answer_____ 105 _____ ninths of cake

9. At a juice bar, $\frac{1}{4}$ of the customers drank orange juice, $\frac{3}{5}$ of the remainder drank apple juice and the others drank pineapple juice.

(a) What fraction of the customers drank apple juice? [1]

$\frac{1}{4}$ of the customers drank orange juice.

$$\text{Remainder} = 1 - \frac{1}{4}$$

$$= \frac{4}{4} - \frac{1}{4}$$

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

$\frac{3}{5}$ of the remainder drank apple juice.

$$\text{Fraction of customers who drank apple juice} = \frac{3}{5} \times \frac{3}{4}$$

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

Answer_____$\frac{9}{20}$_____

(b) If there are 40 customers at the juice bar, how many customers drank pineapple juice? [2]

$$\text{Fraction of customers that drank pineapple juice} = 1 - \left(\frac{1}{4} + \frac{9}{20}\right)$$

$$= 1 - \left(\frac{5}{20} + \frac{9}{20}\right)$$

$$= 1 - \frac{14}{20}$$

$$= \frac{20}{20} - \frac{14}{20}$$

$$= \frac{6}{20}$$

Number of customers that drank pineapple juice $= \frac{6}{20} \times 40$

$$= 12$$

Answer_____ 12 _____ customers

10. If $\frac{6}{7}$ of a number is 54. What is $\frac{4}{21}$ of the same number? [2]

$\frac{6}{7}$ of a number is 54.

The number is $= 54 \div \frac{6}{7}$

$= 54 \times \frac{7}{6}$

$= 63$

$\frac{4}{21}$ of the number $= \frac{4}{21} \times 63$

$= 12$

Answer_____ 12 _____

11. Josiah shared a bag of candy with his two friends. He gave $\frac{1}{6}$ to Jivan and $\frac{3}{4}$ of the remainder to Judah.

(a) What fraction of the candy did Judah get? [2]

Jivan got $\frac{1}{6}$ of the candy.

The fraction of candy remaining $= 1 - \frac{1}{6}$

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

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

Judah got $\frac{3}{4}$ of the remainder.

The fraction of the candy Judah got $= \frac{3}{4} \times \frac{5}{6}$

$$= \frac{15}{24}$$

$$= \frac{5}{8}$$

Answer_____$\frac{5}{8}$_____

(b) What fraction of the candy did Josiah give his friends? [1]

Jivan got $\frac{1}{6}$ of the candy.

Judah got $\frac{5}{8}$ of the candy.

The fraction of the candy Josiah gave to his friends $= \frac{1}{6} + \frac{5}{8}$

$$= \frac{4}{24} + \frac{15}{24}$$

$$= \frac{19}{24}$$

Answer_____$\frac{19}{24}$_____

12. Khyla has 288 muffins of two different types: blueberry and poppyseed. There are three times as many blueberry muffins as there are poppyseed muffins.

(a) How many poppyseed muffins are there? [1]

There are three times as many blueberry muffins as there are poppyseed.

So, $\frac{1}{4}$ of the muffins are poppyseed.

Number of poppyseed muffins $= \frac{1}{4} \times$ Total number of muffins

$$= \frac{1}{4} \times 288$$

$$= 72 \text{ muffins}$$

Answer_____ 72 _____ poppyseed muffins

(b) $\frac{5}{6}$ of the poppyseed muffins have peanuts and the others have raisins. How many poppyseed muffins have raisins? [2]

Fraction of poppyseed muffins that have peanuts $= \frac{5}{6}$

Fraction of poppyseed muffins that have raisins $= 1 - \frac{5}{6}$

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

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

Number of poppyseed muffins that have raisins $= \frac{1}{6} \times 72$

$$= 12 \text{ muffins}$$

Answer_____ 12 _____ poppyseed muffins

(c) A box can hold 16 muffins. How many boxes are needed to pack ALL the blueberry muffins?

[2]

Number of blueberry muffins $= 288 - 72$

$= 216$ muffins

Number of boxes needed $= 216 \div 16$

$= 13.5$ boxes

Answer_____ 13.5 _____ boxes

13. Seven-eighths of a number is 91. What is **quarter** of the same number? [2]

$\frac{7}{8}$ of a number $= 91$

The number is $= 91 \div \frac{7}{8}$

$= 91 \times \frac{8}{7}$

$= 104$

Quarter of the same number $= \frac{1}{4} \times 104$

$= 26$

Answer_____ 26 _____

14. Consider the fractions $\frac{3}{4}$ and $\frac{3}{5}$. The numerators are the same but the denominators are different.

Using words or diagrams to explain your answer, are the two fractions equal to each other? [3]

$$\frac{\text{Numerator}}{\text{Denominator}}$$ → tells us how many of the parts we are considering
→ tells us how many parts the whole is divided into

So, $\frac{3}{4}$ means we are looking at three parts of a whole divided into 4 parts.

$\frac{3}{5}$ means we are looking at three parts of a whole divided into 5 parts.

$\frac{3}{4}$

$\frac{3}{5}$
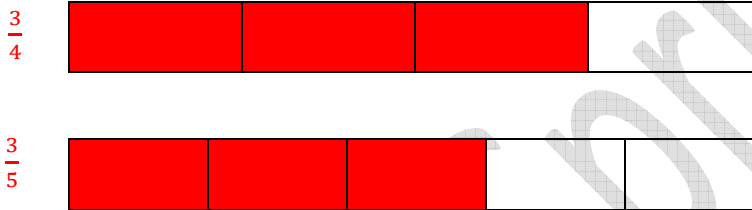
The diagrams show that $\frac{3}{4}$ is not equal to $\frac{3}{5}$.

In general, if we have the same numerators but different denominators, then the fractions will not be the same.

Answer_____ The two fractions are not equal to each other _____

15. A teacher discovered $\frac{2}{5}$ of the pens she recently bought were defective.

She also noticed that $\frac{2}{3}$ of the working pens were black.

If 16 of the working pens were black, how many pens did the teacher buy? [3]

Fraction of pens that are not working $= \frac{2}{5}$

Fraction of pens that are working $= 1 - \frac{2}{5}$

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

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

Now, $\frac{2}{3}$ of the working pens were black.

Fraction of black working pens $= \frac{2}{3} \times \frac{3}{5}$

$$= \frac{6}{15}$$

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

Since 16 of the working pens were black, then

$\frac{2}{5}$ of the pens $= 16$

Total number of pens the teacher bought $= 16 \div \frac{2}{5}$

$$= 16 \times \frac{5}{2}$$

$$= 40 \text{ pens}$$

Answer_____ 40 _____ pens

16. A roll of ribbon was used to make bows. Onella used $\frac{4}{9}$ m, Faith used $\frac{1}{3}$ m and Kareena used $\frac{1}{6}$ m of the roll of ribbon.

Calculate the difference in length between the shortest and longest pieces of ribbon used.   [3]

$$\frac{4}{9} = \frac{8}{18} \qquad , \qquad \frac{1}{3} = \frac{6}{18} \qquad , \qquad \frac{1}{6} = \frac{3}{18}$$

The longest piece of ribbon is $= \frac{4}{9}$

The shortest piece of ribbon is $= \frac{1}{6}$

$$\text{Difference} = \frac{4}{9} - \frac{1}{6}$$

$$= \frac{8}{18} - \frac{3}{18}$$

$$= \frac{5}{18}$$

Answer_____$\frac{5}{18}$_____ m

17. Yannick used $\frac{1}{5}$ of his sticky notes and gave $\frac{4}{7}$ of the remaining sticky notes to his sister. He now has 36 sticky notes remaining. How many sticky notes did Yannick have at first?   [3]

Fraction of sticky notes used $= \frac{1}{5}$

Fraction of remaining sticky notes $= 1 - \frac{1}{5}$

$$= \frac{5}{5} - \frac{1}{5}$$

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

He gave $\frac{4}{7}$ of the remaining sticky notes to his sister.

Fraction of sticky notes given to his sister $= \frac{4}{7} \times \frac{4}{5}$

$$= \frac{16}{35}$$

Fraction of sticky notes he remains with $= 1 - \left(\frac{1}{5} + \frac{16}{35}\right)$

$$= 1 - \left(\frac{7}{35} + \frac{16}{35}\right)$$

$$= 1 - \frac{23}{35}$$

$$= \frac{35}{35} - \frac{23}{35}$$

$$= \frac{12}{35}$$

$\frac{12}{35}$ of the sticky notes $= 36$

Number of sticky notes he had at first $= 36 \div \frac{12}{35}$

$$= 36 \times \frac{35}{12}$$

$$= 105$$

Answer_____ 105 _____ sticky notes

18. There are green, blue and red marbles in a jar. $\frac{3}{4}$ of the marbles are green. $\frac{2}{7}$ of the remainder are red.

What fraction of the marbles are blue? [2]

$\frac{3}{4}$ of the marbles are green.

$$\text{Remainder} = 1 - \frac{3}{4}$$

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

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

$\frac{2}{7}$ of the remainder are red.

$$\text{Fraction of red marbles} = \frac{2}{7} \times \frac{1}{4}$$

$$= \frac{2}{28}$$

$$\text{Fraction of blue marbles} = 1 - \left(\frac{3}{4} + \frac{2}{28} \right)$$

$$= 1 - \left(\frac{21}{28} + \frac{2}{28} \right)$$

$$= 1 - \frac{23}{28}$$

$$= \frac{28}{28} - \frac{23}{28}$$

$$= \frac{5}{28}$$

Answer_____ $\frac{5}{28}$ _____

19. A recipe for 4 pancake servings uses $2\frac{1}{3}$ cups of pancake mix.

   How much cups of pancake mix will be used for 15 pancake servings? [2]

4 servings use $2\frac{1}{3}$ cups of pancake mix.

1 serving will use $= 2\frac{1}{3} \div 4$

$$= \frac{7}{3} \div 4$$

$$= \frac{7}{3} \times \frac{1}{4}$$

$$= \frac{7}{12} \text{ cups of pancake mix}$$

Now,

15 servings will use $= 15 \times \frac{7}{12}$

$$= \frac{105}{12}$$

$$= 8\frac{9}{12}$$

$$= 8\frac{3}{4} \text{ cups of pancake mix}$$

Answer_____ $8\frac{3}{4}$ _____ cups of pancake mix

20. Aries was instructed to use $\frac{5}{8}$ cup of sugar to make each pitcher of mauby. She made 7 pitchers of mauby.

(a) What is the total amount of sugar used? [1]

1 pitcher of mauby requires $\frac{5}{8}$ cup of sugar.

Amount of sugar required for 7 pitchers of mauby $= 7 \times \frac{5}{8}$

$$= \frac{35}{8}$$

$$= 4\frac{3}{8} \text{ cups}$$

Answer_____ $4\frac{3}{8}$ _____ cups of sugar

(b) Between which two whole numbers does your answer lie? [1]

The mixed number $4\frac{3}{8}$ lies between 4 and 5.

Answer_____ 4 and 5 _____