THE STUDENT HUB

Sample Exam 7: Fractions Worksheet - Solutions

Session 7 **Total: 52 marks**

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

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

What are the three numbers? [2]

Looking at the fraction part of the numbers:

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

These fractions are equivalent to:

$\frac{2}{12}$, $\frac{3}{12}$, $\frac{6}{12}$, $\frac{4}{12}$ respectively.

Looking at the numerators, the three numbers that add to give 12 are 2, 6 and 4.

Therefore,

$$1\frac{1}{6} + 2\frac{1}{2} + 2\frac{1}{3} = 1 + 2 + 2 + \frac{1}{6} + \frac{1}{2} + \frac{1}{3}$$

$$= 1 + 2 + 2 + \frac{2}{12} + \frac{6}{12} + \frac{4}{12}$$

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

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

$$= 6$$

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Answer: $1\frac{1}{6}$, $2\frac{1}{2}$, $2\frac{1}{3}$

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2. A bucket holds $7\frac{3}{4}$ litres of water. Patty uses $2\frac{1}{6}$ litres to wash the dishes and $3\frac{1}{2}$ litres to mop the floors. How much water is left in the bucket? [2]

Amount of water used $= 2\frac{1}{6} + 3\frac{1}{2}$

$= 2 + 3 + \frac{1}{6} + \frac{1}{2}$

$= 5 + \frac{2}{12} + \frac{6}{12}$

$= 5 + \frac{8}{12}$

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

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

Amount of water left in bucket $= 7\frac{3}{4} - 5\frac{2}{3}$

Now, $7 - 5 = 2$

And $\frac{3}{4} - \frac{2}{3} = \frac{9}{12} - \frac{8}{12}$

$= \frac{1}{12}$

So, the amount of water left in bucket $= 2 + \frac{1}{12}$

$= 2\frac{1}{12}$ litres

Answer: $2\frac{1}{2}$ litres

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

$$\frac{2}{3} \square \frac{3}{5}$$

$\frac{2}{3} = \frac{10}{15}$

$\frac{3}{5} = \frac{9}{15}$

Since $10 > 9$, then $\frac{2}{3} > \frac{3}{5}$.

Answer: $\frac{2}{3}$ $\boxed{>}$ $\frac{3}{5}$

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

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

$= \frac{10}{15} - \frac{9}{15}$

$= \frac{1}{15}$

Answer: $\frac{1}{15}$

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4. One third of a number is 21. What is $\frac{4}{7}$ of the same number? [2]

$\frac{1}{3}$ of a number is 21.

1 part = 21

3 parts = 3×21

$= 63$

Now,

$\frac{4}{7} \times 63 = \frac{4}{7} \times \frac{63}{1}$

$\frac{4}{7} \times 63 = 36$

Answer: 36

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5. Chris had a piece of tape that was $4\frac{5}{6}$ m long. He used $2\frac{2}{3}$ of it in an art project. What is the length of the remaining piece of tape? [2]

Length of remaining piece of tape $= 4\frac{5}{6} - 2\frac{2}{3}$

Now, $4 - 2 = 2$

And $\frac{5}{6} - \frac{2}{3} = \frac{5}{6} - \frac{4}{6}$

$= \frac{1}{6}$

Length of remaining piece of tape $= 2 + \frac{1}{6}$

$= 2\frac{1}{6}$ m

Answer: $2\frac{1}{6}$ m

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6. The product of two numbers is 7. One of them is $4\frac{1}{5}$.

   What is the other number? [3]

The product of two numbers $= 7$

One number $= 4\frac{1}{5}$

$= \frac{21}{5}$

The other number $= 7 \div \frac{21}{5}$

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

$= \frac{5}{3}$

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

Answer: $1\frac{2}{3}$

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7. Diana's weekly allowance is \$80. She spent $\frac{1}{4}$ of it on stationery, $\frac{2}{5}$ of it on candy and saved the remainder.

(a) What fraction did she spend on the stationery and candy together? [1]

Fraction of money spent $= \frac{1}{4} + \frac{2}{5}$

$= \frac{5}{20} + \frac{8}{20}$

$= \frac{13}{20}$

Answer: $\frac{13}{20}$

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

Fraction of money saved $= 1 - \frac{13}{20}$

$= \frac{20}{20} - \frac{13}{20}$

$= \frac{7}{20}$

Amount of money saved $= \frac{7}{20} \times 80$

$= \$28$

Answer: \$28

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8. The bakery cuts 9 pies into EIGHTHS. Kylie gets $\frac{1}{4}$ of ONE pie.

(a) How many EIGHTHS of pie does she get? [1]

$\frac{1}{4} = \frac{2}{8}$

Answer: 2 eighths of pie

(b) How many EIGHTHS of pie does the bakery have remaining. [2]

9 pies $= 9 \times 8$

$= 72$ eighths

Kylie received 2 eighths of pie.

Number of eighths of pie remaining $= 72 - 2$

$= 70$

Answer: 70 eighths of pie

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9. At a diner, $\frac{1}{5}$ of the customers drank ginger tea, $\frac{2}{3}$ of the remainder drank coffee and the others drank water.

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

$\frac{1}{5}$ of the customers drank ginger tea.

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

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

$= \frac{4}{5}$

$\frac{2}{3}$ of the remainder drank coffee.

Fraction of customers who drank coffee $= \frac{2}{3} \times \frac{4}{5}$

$= \frac{8}{15}$

Answer: $\frac{8}{15}$

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(b) If there are 60 customers at the diner, how many customers drank water? [2]

Fraction of customers that drank water $= 1 - \left(\frac{1}{5} + \frac{8}{15}\right)$

$= 1 - \left(\frac{3}{15} + \frac{8}{15}\right)$

$= 1 - \frac{11}{15}$

$= \frac{15}{15} - \frac{11}{15}$

$= \frac{4}{15}$

Number of customers that drank water $= \frac{4}{15} \times 60$

$= 16$

Answer: 16 customers

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10. If $\frac{3}{4}$ of a number is 39. What is $\frac{2}{13}$ of the same number? [2]

$\frac{3}{4}$ of a number is 39.

The number is $= 39 \div \frac{3}{4}$

$= 39 \times \frac{4}{3}$

$= 52$

$\frac{2}{13}$ of the number $= \frac{2}{13} \times 52$

$= 8$

Answer: 8

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11. Danny shared a bag of marbles with his two friends. He gave $\frac{2}{5}$ to Mark and $\frac{1}{6}$ of the remainder to Alex.

(a) What fraction of the marbles did Alex get? [2]

Mark got $\frac{2}{5}$ of the marbles.

The fraction of marbles remaining $= 1 - \frac{2}{5}$

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

$= \frac{3}{5}$

Alex got $\frac{1}{6}$ of the remainder.

The fraction of the marbles Alex got $= \frac{1}{6} \times \frac{3}{5}$

$= \frac{1}{10}$

Answer: $\frac{1}{10}$

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(b) What fraction of the marbles did Danny give his friends? [1]

Mark got $\frac{2}{5}$ of the marbles.

Alex got $\frac{1}{10}$ of the marbles.

The fraction of the marbles Danny gave to his friends $= \frac{2}{5} + \frac{1}{10}$

$= \frac{4}{10} + \frac{1}{10}$

$= \frac{5}{10}$

$= \frac{1}{2}$

Answer: $\frac{1}{2}$

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12. Paige has 315 cupcakes of two different flavours: chocolate and vanilla. There are twice as many chocolate cupcakes as there are vanilla.

(a) How many vanilla cupcakes are there? [1]

There are twice as many chocolate cupcakes as there are vanilla.

So, $\frac{1}{3}$ of the cupcakes are vanilla.

Number of vanilla cupcakes $= \frac{1}{3} \times$ Total number of cupcakes

$= \frac{1}{3} \times 315$

$= 105$ cupcakes

Answer: 105 vanilla cupcakes

(b) $\frac{3}{5}$ of the vanilla cupcakes have icing and the other have sprinkles. How many vanilla cupcakes have sprinkles? [2]

Fraction of vanilla cupcakes that have icing $= \frac{3}{5}$

Fraction of vanilla cupcakes that have sprinkles $= 1 - \frac{3}{5}$

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

$= \frac{2}{5}$

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Number of vanilla cupcakes that have sprinkles $= \frac{2}{5} \times 105$

$= 42$ cupcakes

Answer: 42 vanilla cupcakes

(c) A container can hold 15 cupcakes. How many containers are needed to pack ALL the chocolate cupcakes? [2]

Number of chocolate cupcakes $= 315 - 105$

$= 210$ cupcakes

Number of containers needed $= 210 \div 15$

$= 14$ containers

Answer: 14 containers

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13. Two-fifths of a number is 28. What is **half** of the same number? [2]

$\frac{2}{5}$ of a number $= 28$

The number is $= 28 \div \frac{2}{5}$

$= 28 \times \frac{5}{2}$

$= 70$

Half of the same number $= \frac{1}{2} \times 70$

$= 35$

Answer: 35

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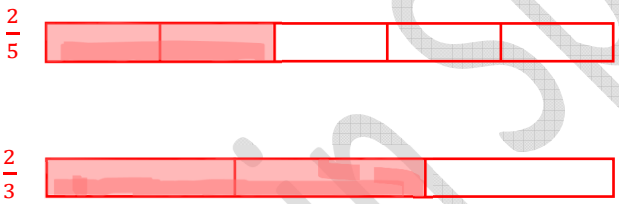
14. Consider the fractions $\frac{2}{5}$ and $\frac{2}{3}$. The numerators are the same but the denominators are different. Using words or diagrams to explain your answer, are the two fractions equal to each other? [3]

Numerator → tells us how many of the parts we are considering

Denominator → tells us how many parts the whole is divided into

So, $\frac{2}{5}$ means we are looking at two parts of a whole divided into 5 parts.

$\frac{2}{3}$ means we are looking at two parts of a whole divided into 3 parts.



The diagrams show that $\frac{2}{53}$ is not equal to $\frac{2}{3}$.

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

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15. A company discovered $\frac{1}{3}$ of the bulbs bought were not working. They also noticed that $\frac{2}{5}$ of the working bulbs were blue. If 48 of the working bulbs were blue, how many bulbs did the company buy? [3]

Fraction of bulbs that are not working $= \frac{1}{3}$

Fraction of bulbs that are working $= 1 - \frac{1}{3}$

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

$= \frac{2}{3}$

Now, $\frac{2}{5}$ of the working bulbs were blue.

Fraction of blue working bulbs $= \frac{2}{5} \times \frac{2}{3}$

$= \frac{4}{15}$

Since 48 of the working bulbs were blue, then

$\frac{4}{15}$ of the bulbs $= 48$

Total number of bulbs the company bought $= 48 \div \frac{4}{15}$

$= 48 \times \frac{15}{4}$

$= 180$ bulbs

Answer: 180 bulbs

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16. A roll of string was used to make jewellery. Rebecca used $\frac{5}{8}$ m, Lucy used $\frac{1}{6}$ m and Kim used $\frac{1}{12}$ m of the roll of string. Calculate the difference in length between the shortest and longest pieces of string used. [3]

$\frac{5}{8} = \frac{15}{24}$, $\frac{1}{6} = \frac{4}{24}$, $\frac{1}{12} = \frac{2}{24}$

The longest piece of string is $= \frac{5}{8}$

The shortest piece of string is $= \frac{1}{12}$

Difference $= \frac{5}{8} - \frac{1}{12}$

$= \frac{15}{24} - \frac{2}{24}$

$= \frac{13}{24}$

Answer: $\frac{13}{24}$ m

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17. Henry used $\frac{1}{4}$ of his stickers in a project and lent $\frac{2}{9}$ of the remaining stickers to his friend. He now has 21 stickers remaining. How many stickers did Henry have at first? [3]

Fraction of stickers used in a project $= \frac{1}{4}$

Fraction of remaining stickers after project $= 1 - \frac{1}{4}$

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

$= \frac{3}{4}$

He lent $\frac{2}{9}$ of the remaining stickers to his friend.

Fraction of stickers lent to his friend $= \frac{2}{9} \times \frac{3}{4}$

$= \frac{1}{6}$

Fraction of stickers he remains with $= 1 - \left(\frac{1}{4} + \frac{1}{6}\right)$

$= 1 - \left(\frac{3}{12} + \frac{2}{12}\right)$

$= 1 - \frac{5}{12}$

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

$= \frac{7}{12}$

Now,

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$\frac{7}{12}$ of the stickers $= 21$

Number of stickers he had at first $= 21 \div \frac{7}{12}$

$= 21 \times \frac{12}{7}$

$= 36$

Answer: 36 stickers

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18. There are red, blue and yellow beads in a jar. $\frac{1}{4}$ of the beads are blue. $\frac{2}{3}$ of the remainder are yellow. What fraction of the beads are red? [2]

$\frac{1}{4}$ of the beads are blue.

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

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

$= \frac{3}{4}$

$\frac{2}{3}$ of the remainder are yellow.

Fraction of yellow beads $= \frac{2}{3} \times \frac{3}{4}$

$= \frac{1}{2}$

Fraction of red beads $= 1 - \left(\frac{1}{4} + \frac{1}{2}\right)$

$= 1 - \left(\frac{1}{4} + \frac{2}{4}\right)$

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

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

$= \frac{1}{4}$

Answer: $\frac{1}{4}$

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19. A recipe for 3 servings use $1\frac{5}{6}$ cups of corn flour. How much corn flour will be used for 12 servings? [2]

3 servings use $1\frac{5}{6}$ cups of corn flour.

1 serving will use $= 1\frac{5}{6} \div 3$

$= \frac{11}{6} \div 3$

$= \frac{11}{6} \times \frac{1}{3}$

$= \frac{11}{18}$ cups of flour

Now,

12 servings will use $= 12 \times \frac{11}{18}$

$= \frac{22}{3}$

$= 7\frac{1}{3}$ cups of corn flour

Answer: $7\frac{1}{3}$ cups of flour

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20. A recipe required $\frac{3}{8}$ cup of sugar to make a cake. The chef made 12 cakes.

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

1 cake requires $\frac{3}{8}$ cup of sugar.

Amount of sugar required for 12 cakes $= 12 \times \frac{3}{8}$

$= \frac{9}{2}$

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

Answer: $4\frac{1}{2}$ cups

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

The number $4\frac{1}{2}$ lies between 4 and 5.

Answer: 4 and 5

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