UNIT 5: FRACTIONS

Exercise 1: Find five fractions that are equivalent to $\frac{8}{20}$

Exercise 2: Which of the fractions $\frac{6}{10}, \frac{9}{15}, \frac{12}{18}$ and $\frac{15}{25}$ are equivalent?

Exercise 3: Decide if the following fractions are equivalent:

a) $\frac{8}{14}$ and $\frac{12}{21}$ b) $\frac{8}{5}$ and $\frac{5}{3}$ c) $\frac{10}{6}$ and $\frac{15}{9}$ d) $\frac{20}{24}$ and $\frac{35}{42}$

Exercise 4: Find the value of x and y so that the following fractions are equivalent:

a) $\frac{x}{2}=\frac{20}{10}$ b) $\frac{8}{x}=\frac{12}{15}$ c) $\frac{2}{12}=\frac{5}{x}$

d) $\frac{7}{4}=\frac{x}{8}$ e) $\frac{2}{x}=\frac{x}{8}$ f) $\frac{x}{6}=\frac{7}{2}=\frac{28}{y}$

Exercise 5: Express each of the following fractions as a decimal number and classify them:

a) $\frac{7}{2}$ b) $\frac{15}{9}$ c) $\frac{5}{7}$

d) $\frac{17}{6}$ e) $\frac{19}{14}$ f) $\frac{2}{5}$

Exercise 6: Express each of the following fractions in lowest terms:

a) $\frac{27}{18}$ b) $\frac{36}{72}$ c) $\frac{156}{204}$

d) $\frac{23}{31}$ e) $\frac{85}{17}$ f) $\frac{11550000}{18480000}$

Exercise 7: Mary and Matt have decided to spend the weekend in Madrid, but they can't agree about the way to get there. Mary has decided to travel by train, while Matt is taking the car. At 7:00 PM they whatsapp each other to ask where they are, but they are still angry at each other and they don't want to provide the information. So Mary says that she has covered $7/12$ of the distance. Matt stops the car, takes a notebook and a pen and answers that he has covered $8/15$. Which one of them will arrive sooner in Madrid?

Exercise 8: Sophie wants to spend part of her Christmas holidays rearranging the plants in her garden, but it is a huge one and she's not sure that she can make it alone, so she calls her friend Pam and asks her to help her in exchange for coffee and chocolate cookies. But it's been snowing and Pam only managed to finish $3/7$ of the garden, while Sophie finished $2/5$. Which one has worked harder? Do you think Sophie's plan was a good one?

Exercise 9: Write the following fractions in order of size, starting with the smallest:

a) $\frac{5}{6}, \frac{4}{5}, \frac{3}{4}$

b) $\frac{3}{5}, \frac{5}{8}, \frac{1}{4}, \frac{7}{10}$

c) $\frac{7}{6}, \frac{1}{3}, \frac{5}{4}, \frac{3}{8}, 1$

d) $\frac{7}{4}, \frac{11}{9}, 2, \frac{8}{3}, \frac{5}{2}$

Exercise 10: Find two fractions between:

a) $\frac{7}{12}$ and $\frac{8}{18}$

b) $\frac{7}{8}$ and $\frac{8}{9}$

Exercise 11: Work out:

a) $\frac{11}{9}+\frac{7}{9}=$

b) $\frac{2}{3}-\frac{5}{8}+\frac{1}{2}-1=$

c) $4-\frac{11}{3}-\frac{5}{6}+\frac{3}{4}=$

d) $1-\frac{1}{2}+\frac{1}{3}-\frac{1}{4}+\frac{1}{5}=$

e) $\frac{-3}{7}+\frac{2}{3}-\frac{5}{2}+1=$

f) $\frac{2}{7}+2-\frac{1}{4}-\frac{5}{2}=$

Exercise 12: Work out:

a) $\frac{5}{8}-\left(\frac{1}{3}+\frac{3}{2}+1\right)=$

b) $\frac{1}{5}-\left(\frac{4}{3}-\frac{3}{2}\right)=$

c) $-\frac{3}{4}-\left(\frac{1}{5}+2-\frac{3}{2}\right)=$

d) $\left(2-\frac{3}{2}\right)-\left(1-\frac{1}{5}\right)=$

e) $\left(\frac{3}{2}-\frac{8}{5}\right)+\left(\frac{2}{7}+\frac{1}{4}\right)=$

f) $\frac{1}{3}-\left(1-\frac{9}{7}\right)=$

Exercise 13: Work out:

a) $\left(\frac{1}{4}:\frac{2}{5}\right)\cdot\left(\frac{3}{4}:\frac{7}{6}\right)=$

b) $\frac{2}{3}+\frac{1}{5}\cdot\frac{3}{2}-\frac{7}{4}:\frac{2}{3}=$

c) $\frac{2}{7}\cdot\frac{7}{5}+1-\frac{3}{5}:\frac{4}{7}=$

d) $\left(\frac{3}{8}+\frac{5}{2}\right)\cdot\left(\frac{1}{3}-\frac{1}{4}\right)=$

e) $\frac{1}{2}\cdot\frac{7}{3}:\left(\frac{1}{2}+\frac{2}{3}\right)=$

f) $\left(\frac{5}{2}-\frac{4}{3}\right):\left(\frac{1}{2}:\frac{6}{7}\right)=$

Exercise 14: Work out:

a) $\left(-\frac{5}{2}\right)^3=$

b) $\frac{7}{3}:\sqrt{\frac{25}{16}}-\left(-\frac{3}{2}\right)^2-\left(\frac{1}{2}\right)^3=$

c) $\sqrt{\frac{2}{3}\cdot\frac{10}{2}:\frac{6}{5}}=$

d) $\frac{10}{9}:\frac{2}{3}-\left(\frac{7}{6}\right)^2+\frac{7}{9}\cdot\frac{5}{2}-\left(\frac{3}{2}\right)^2=$

e) $\left(\frac{3}{2}-\frac{1}{3}\right)^2-\sqrt{\frac{5}{4}-\frac{11}{9}}-\sqrt{\left(1-\frac{1}{5}\right):\frac{5}{9}}=$

f) $\left(\frac{3}{5}-\frac{2}{3}\right)^2-\left(1-\frac{2}{3}\right)^2+\sqrt{\frac{3}{5}:\frac{5}{27}}=$

Exercise 15: Work out:

a) $\left(\frac{2}{3}-\frac{4}{5}\right)^{-2}=$

b) $\left(\frac{5}{2}\right)^{-2}-\frac{3}{10}=$

c) $\left(\frac{7}{5}+\frac{3}{2}\right)^{-1}=$

d) $\left(\frac{2}{5}-\frac{3}{4}\cdot\frac{5}{2}\right)^{-1}=$

e) $\left(3-\frac{2}{5}\cdot\frac{3}{7}\right)^{-1}=$

f) $\left(\frac{2}{5}-\frac{1}{3}\right)^{-2}\cdot\left(\frac{3}{4}-\frac{8}{3}\right)^{-1}=$

Exercise 16: Work out:

a) $\frac{3}{5}+\left(\frac{2}{7}\right)^{-1}=$

b) $\left(\frac{5}{6}-\frac{7}{4}\right)^{-2}=$

c) $\left(\frac{8}{5}\right)^{-2}\cdot\frac{4}{3}=$

d) $\left(\frac{2}{3}-\frac{1}{4}:\frac{5}{2}\right)^{-1}=$

Exercise 17: Work out:

a) $\left(\sqrt{\frac{32}{3}:\frac{12}{2}}\right)^{-1}=$

b) $\sqrt{\frac{25}{16}}-\left(\frac{2}{3}\right)^{-2}+\frac{3}{2}:\frac{5}{7}=$

c) $\left(\frac{3}{2}:\frac{5}{4}\right)^{-2}-\left(\frac{2}{5}\right)^{-2}-\left(\frac{7}{2}+\frac{5}{6}\right)=$

d) $\left(\sqrt{\frac{1}{4}}\right)^{-3}:\left(\frac{3}{5}\right)^{-2}=$

e) $\left(\frac{3}{5}\cdot\frac{4}{7}\right)^{-1}:\left(\frac{7}{4}+\frac{7}{6}\right)=$

Exercise 18: Work out:

a) $\frac{13}{9}$ of $72=$

b) $\frac{7}{17}$ of $51=$

c) $\frac{5}{7}$ of $560=$

d) $\frac{5}{6}$ of $128=$

e) $\frac{4}{7}$ of $\frac{3}{7}=$

f) $\frac{4}{10}$ of $\frac{25}{20}=$

Exercise 19: My math handbook has 10 units and during the first term we are studying two fifths of them. How many units are left for the rest of the academic year?

Exercise 20: I usually prepare half a liter of coffee in the morning and I drink half of it before I come to work. How many cl of coffee do I drink in the morning?

Exercise 21: A train travelling between Seville and Malaga covers two fifths of the 300 km between both cities before the first stop. How many km has the train travelled so far?

Exercise 22: Scientists say that only one part out of twenty of your daily calories intake should come from added sugar. If a person has a diet of 1750 calories a day:

a) What's the maximum amount daily calories coming from added sugar?
b) A teaspoon of sugar has 16 calories. How many teaspoons can you have a day?

Exercise 23: Two sevenths of the inhabitants of a city go to the cinema at least twice a year. If there are 35000 people living in that city, how many of them go to the cinema less than twice a year?

Exercise 24: Jenny has an orchard with different fruit trees. She has planted two fifths with peach trees, three sevenths with plum trees and one tenth with almond trees. What fraction of the orchard remains unplanted?

Exercise 25: Jon has a collection of football stamps and eighty of them are repeated. He gives half of them to his friend Sam, and he gives his brother Rickon one quarter of the remaining stamps.

a) How many repeated stamps has Jon in the end?
b) What fraction of the stamps has he given away?

Exercise 26: We have to finish a PowerPoint presentation for next week. Yesterday we put together three sevenths of it, and today two thirds of the remaining part.

a) What fraction is already finished?
b) What fraction is left?
c) If the presentation has to be 35 pages long, how many pages do we still have to write? What does that mean?

Exercise 27: Last week I bought a one liter bottle of soda. I drank one quarter and then my brother drank two thirds of what was left.

a) What fraction of the bottle remains?
b) My mom wants a glass with 330 ml of soda. Is there enough liquid left in the bottle?

Exercise 28: When she gets back from her holidays, Helen prints three fifths of the pictures that she took. If she still has forty pictures left to print, how many pics did Helen take?

Exercise 29: Sansa is dreaming that she eats two fifths of a box of cookies, and her brother Bran eats the remaining eighteen cookies. How many cookies were there in the box?

Exercise 30: Jamie spent three quarters of his pocket money and now he has fourteen gold coins left. How much money did he have?

Exercise 31: Yesterday I had to go to the market to replenish the weekly supply of chicken to feed my dragons. If they eat two sevenths of the chickens on Tuesday, another two sevenths on Thursday and I still have 45 chickens left for the weekend, how many chickens do I have to buy every week?

Exercise 32: Laura spent part of her holidays in Japan last summer. She was short of money, so she opted for a flight with three legs, longer but cheaper. First she flew one eighth of the distance, from Madrid, and arrived in Amsterdam. Then she flew thirteen over fourteen of the remaining distance from Amsterdam to Nagasaki. If she still has 800 km to get to Tokyo, what's the total distance from Madrid to Tokyo?

Exercise 33: In a high school, one third of the students play basketball and two fifths of the rest attend the music school. The remaining two hundred and sixteen students attend private lessons.

a) What fraction of the students play basketball or attend the music school?

b) How many students are there in the school?

Exercise 34: I am already planning my birthday party. This year I am gonna invite elves, fairies and unicorns. No people. They are boring. We'll make it to the newspapers. One third of the tables are meant for the elves, three fifths of the remaining tables for the fairies, and the rest, for the unicorns.

a) What fraction of the tables will occupy the elves, the fairies and the unicorns?

b) I am gonna invite 28 unicorns. How many creatures will attend in total?

Exercise 35: Almost all the blinds in my work place are half broken, but we made complaint and they are already fixing them. Last week they checked three fifths, and this week, two thirds of the remaining ones. If they still have twenty blinds to check:

a) What fraction of the blinds have they already checked?

b) What fraction do they still have to check?

c) How many blinds are there in total?

Exercise 36: Each month, a family spends two fifths of their income to pay the mortgage, and one third in food. They still have four hundred euro left. How much do they earn each month?