UNIT 4: RATIONAL NUMBERS

Exercise 1: Work out:

a) $7.39+2.725=$
b) $839.42-615.7293=$
c) $52.741-60.29=$
d) $0.00327-0.00846=$

Exercise 2: Work out:

a) $5.7\cdot 42.29=$
b) $0.472\cdot 37=$
c) $5.29\cdot 2.8=$
d) $239.72\cdot 29.17=$

Exercise 3: Work out:

a) $72.596\cdot 0.05=$
b) $0.039\cdot 0.0082=$
c) $6721.48392\cdot 10000=$
d) $9.32\cdot 1000=$

Exercise 4: Work out and express the answer with four decimal figures:

a) $0.97:0.8=$
b) $24.75:0.004=$
c) $3.17:9.5=$
d) $0.42:0.19=$
e) $6.27:9.284=$
f) $15.93:1000=$

Exercise 5: Work out and express with three decimal figures:

a) $2.7+0.8\cdot(3.92-1.7)=$
b) $7.3\cdot 2.4-6.5\cdot 4.7+8.32:4.1=$
c) $56.42:5.7-2.9\cdot 12.3=$
d) $5.42-2.7\cdot(1.25-2.73)=$

Exercise 6: The human hair grows at a rate of 1.25 cm a month.

a) How much longer will my hair be a year later if I don't cut it?
b) I want my hair to be 25 cm longer. How long is it going to take?

Exercise 7: When I go to Malaga to spend the day at the beach, I like to leave my car at an underground parking, so I don't have to be worried about it. If I want to leave my car in there for an hour I have to pay 1.26€, but I am staying for nine hours and a half.

a) How much is it going to cost?
b) The price of a round-trip train ticket is 44€. Should I use the train instead?

Exercise 8: My car needs 7.2 liters of gas to run for 100 km. Knowing that Malaga is 162.6 km away and that the price of a liter of gas is 1.36€, how much is it going to cost? Should I use the train instead?

Exercise 9: Last Saturday we had something to eat at a restaurant. We had three portions, 12.50€ each, two half portions, 6.75€ each and eight drinks, 1.40€ each. Two of us also wanted something sweet for dessert, a piece of tiramisu that cost 4.25€ and a piece of cheesecake that cost 3.75€.

a) Find the amount of the bill we were presented with.
b) There were four of us and we split the bill. How much did each of us have to pay?

Exercise 10: Last summer I decided to buy some sandals online, since they were on sale. I bought one pair that cost 22.95€ and another pair that cost 24.99€. The shipping costs were 4.95€

a) How much money did I have to pay?
b) If I spend over 50€ then the shipping is free, so I got another pair of sandals, that cost 19.95€. How much money do I have to pay now?

Exercise 11: The law states that fire extinguishers must be at a maximum distance of 8.5 m from one another. If the hallway of my high school is 46.2 m long, how many fire extinguishers do we have to place?

Exercise 12: A farmer harvests 1290 kilos of wheat that he sells in the market for 219.30€. Then the wheat is separated into twelve batches and sold to twelve bakeries for them to prepare their daily bread. If the price of each batch is of 51.6€, what's the profit the market gets for each kilo of wheat?

Exercise 13: The average water consumption per day in the city of Córdoba during 2016 was of 43847.26 cubic meters. Knowing that Córdoba had a population of 326609 people back then, how many liters of water did each one of its inhabitants use every day?

Exercise 14: A worker has a salary of 1575.40€ a month. A certain month he has to pay 580.25€ for the mortgage, 39.95€ for the Internet and TV service, 24.90€ for each of the three mobile phone lines, 65.20€ for the energy bill, 22.40€ for the water bill, 34.95€ for the academy of each one of his two kids, 25.60€ for tennis lessons and 24.10€ for judo lessons. If he also needs 584.85€ for groceries and clothes, how much money can he save?

Exercise 15: Write with numbers:

a) Seventy-two thousandths
b) Three hundred and sixty-seven ten-thousandths
c) Fifty-seven ones, four thousand one hundred and five hundred-thousandths
d) Two ones and fifty hundredths
e) Seventy ones, two hundred and eighty-six millionths
f) One hundred ones, nine thousand five hundred and forty-eight ten-thousandths

Exercise 16: Turn these numbers into the required units:

a) 235 tenths into hundredths
b) 37.49 ten-thousandths into thousandths
c) 374.23 thousandths into tenths
d) 80 millionths into ten-thousandths
e) 7.42 ten-thousandths into millionths
f) 14.79 tenths into ten-thousandths
g) 27 hundredths into hundred-thousandths
h) 8.7 hundred-thousandths into hundredths
i) 479 millionths into thousandths

Exercise 17: Round the following numbers to the nearest tenths and to the nearest thousandths:

7.398427 32.171819 0.244138 0.074321 0.024861 5.799999

Exercise 18: Round π to the nearest hundredths and to the nearest ten-thousandths.

$$\pi \simeq 3.14159265358979323846264338327950288419 71$$

Exercise 19: Write each of the following fractions as a decimal number and the classify them:

a) $\frac{28}{6} =$ b) $\frac{21}{6} =$ c) $\frac{26}{15} =$

d) $\frac{40}{35} =$ e) $\frac{41}{12} =$ f) $\frac{42}{11} =$

Exercise 20: Express the following numbers as fractions:

a) $0.2 =$ b) $1.\overline{7} =$ c) $15.375\overline{2} =$

d) $498.3\overline{72} =$ e) $427.\overline{12} =$ f) $0.\overline{039} =$

g) $12.755555 =$ h) $0.24\overline{38} =$ i) $34.\overline{87325} =$

Exercise 21: Transform the following rational numbers into fractions:

a) $0.0834 =$ b) $847.\overline{4} =$

c) $3.279\overline{5} =$ d) $0.\overline{58} =$

e) $5.272727 =$ f) $37.\overline{8942} =$

g) $23.472\overline{31} =$ h) $2.\overline{9} =$

Exercise 22: Write the following numbers using scientific notation:

a) 31 415 926 535 897 932 384 626 433 832 =

b) 0.000027182818285 =

c) 3 879 482 300 000 000 000 000 =

d) 435 893 579 324 147 210 =

e) 0.000 000 056 432 7=

f) 0. 000 000 000 000 068=

Exercise 23: Write the following numbers using scientific notation:

a) The Solar mass: 1 984 700 000 000 000 000 000 000 000 000 kg

b) The mass of a muon in grams: 0.000 000 000 000 000 000 000 000 000 188 353 159 kg

c) The world population on 09/08/2018, 7611817873 people

d) The diameter of a hair in meters 0.07 mm

e) The diameter of the Sun, 1400000 km, in meters

f) The radius of a red blood cell, in meters, if its diameter is 0.006 mm

Exercise 24: Expand these numbers expressed in scientific notation:

a) $3.85 \cdot 10^{7} =$ b) $4.2 \cdot 10^{10} =$ c) $2.38 \cdot 10^{-9} =$

d) $5.7 \cdot 10^{-12} =$ e) $3 \cdot 10^{12} =$ f) $0.72 \cdot 10^{5} =$

Exercise 25: Write these numbers using scientific notation:

a) $853.794 \cdot 10^{-5} =$ b) $0.0032864 \cdot 10^{7} =$ c) $42835.729 \cdot 10^{4} =$

d) $4672314.25 \cdot 10^{-9} =$ e) $0.00016234 \cdot 10^{-7} =$ f) $345.7865 \cdot 10^{4} =$

Exercise 26: Write these numbers using scientific notation:

a) $0.0003141 \cdot 10^{3} =$ b) $12354.3872 \cdot 10^{15} =$

c) $0.39 \cdot 10^{-6} =$ d) $2945.63 \cdot 10^{-8} =$

e) $197.92 \cdot 10^{7} =$ f) $0.4372 \cdot 10^{-3} =$