UNIT 1: NATURAL NUMBERS AND DIVISIBILITY

Exercise 1: Solve the following operations with natural numbers:

a) $3+9\cdot 4-(5-2)^2=$
b) $3\cdot[13+3\cdot(15-2)]=$
c) $1+4\cdot(7-5)+3\cdot(9-7)=$
d) $7+2\cdot[4-10:5+2\cdot(10-3)]=$
e) $3+7\cdot 4-(5-2)^2=$
f) $4\cdot 5-3+4\cdot(3+2\cdot 9)=$
g) $7+4:2-1^{12}+4\cdot(8-9:3)=$
h) $180-6\cdot(13-4\cdot 2)^2=$
i) $9-16:2+1^{25}+5\cdot(3+7\cdot 2-1)=$
j) $5+4\cdot(9-7)-12:(15-3\cdot 4)=$
k) $2+3\cdot(12-9)-12:6+1^{15}=$
l) $1+6\cdot(12-5\cdot 2)^3-20:4=$

Exercise 2: I want to buy three shirts, 8€ each, two trousers, 15€ each and a pair of shoes, 25€. I have 75€, do I have enough money?

Exercise 3: A man sells 25 kg of apples, 2€ each, and 27 kg of peaches, 3€ each. He wants to buy a suit that costs 150€. Does he have enough money?

Exercise 4: Juana has 142384€ in the bank and she wins 52325€ in the lottery. How much money does she need to buy a house that costs 264000€?

Exercise 5: A salesman gets an order for 35 television sets that cost 208€ each. How much money does he earn in total?

Exercise 6: A dumping lorry carries 8500 kilos of sand each time it makes a trip. How many kilos does it carry in a total of 15 trips?

Exercise 7: A factory produces 213 bikes every day. If it sells each of them for 158€, how much money does it make over a month?
Note: in Math all months always have 30 days

Exercise 8: 117 sugar cubes are split among 9 bowls. How many cubes does each bowl hold?

Exercise 9: If you have a load of 247 kilos of potatoes, how many 7 kilos sacks could you fill with them? How many kilos are left over?

Exercise 10: Four partners split 7328€ of profits from their business. How much money does each of them get?

Exercise 11: On a farm, 547 eggs are collected every day and placed into cartons of one dozen. How many cartons are filled? How many eggs are left?

Exercise 12: A truck is carrying 12 identical pallets that have a combined weight of 2496 kilos. How much does each pallet weigh?

Exercise 13: A company pays 8640€ to rent an office for six months. Supposing that each month has a total of 30 days, how much money does the company pay each day?

Exercise 14: Laurent is organizing the food for a party. He needs enough sausages and bread rolls to make 31 hot dogs. He buys 4 packs of 8 sausages and 5 packs of 6 bread rolls. Has he bought enough packs to make all the hot dogs? Is there any ingredient missing? What else does he need?

Exercise 15: Alan cycles to work every day, a six miles trip from home. How many miles does he travel in a year? Justify your answer.

Exercise 16: Bill buys a second-hand television set for 156€. He pays 25€ for some repairs and sells it for 191€. What's the profit?

Exercise 17: Find two numbers:

a) with a product of 20 and a difference of 1
b) with a sum of 7 and a product of 12
c) with a sum of 8 and a quotient of 3
d) that add to 15 and whose product is 42

Exercise 18: Indicate if the following statements are true or false and why

a) Forty-nine is a multiple of seven
b) Twenty-five is a divisor of five
c) Thirty is a multiple of nine
d) Twelve is a multiple of twenty-four
e) Seven is a divisor of one hundred and five

Exercise 19: Write the first four multiples of thirteen

Exercise 20: Write five multiples of nine that are greater than two hundred

Exercise 21: Write the first three multiples of twelve that are greater than ninety-six

Exercise 22: Write three multiples of eleven between thirty and fifty

Exercise 23: Determine if the following statements are true or false, and why.

a) 13640 is a multiple of 5, 10 and 11
b) 7 is a divisor of 63
c) 9 is a divisor of 42
d) 17 is a multiple of 51
e) 165 is a multiple of 3 and 5
f) 11 is a divisor of 45694

Exercise 24: Determine if the following statements are true or false, and why.

a) 13640 is a multiple of 5, 10 and 11
b) 7 is a divisor of 63
c) 9 is a divisor of 42
d) 17 is a multiple of 51
e) 165 is a multiple of 3 and 5
f) 11 is a divisor of 45694

Exercise 25: Find the value of the digit x so that the following numbers:

a) 78654x is a multiple of 2
b) 8x237 is a multiple of 5
c) 54739x is a multiple of 3
d) 73x42 can be divided by 5
e) 9423x can be divided by 11
f) 7x821 can be divided by 3

Exercise 26: There are thirty-four students in 1ºA.

a) Their teacher decided to place them in rows with three students each and she realized that one of the students had to be alone. Why?

b) Would they all have a partner if the rows had two students?

c) And if she places four students in each row? What is the distribution of the classroom now?

Exercise 27: Work out all the divisors of the numbers 27, 52, 70, 120, and 128

Exercise 28: Work out all the divisors of the numbers 17, 81, 90, 121, and 150

Exercise 29: We want to divide ninety doughnuts into equal boxes. How many possibilities are there? List them all.

Exercise 30: How many different ways are there to divide 48 chocolates into chocolate boxes? List them all.

Exercise 31: Write all the possible ways to distribute 40 T-shirts in boxes so all the boxes are identical.

Exercise 32: Factor out the numbers 49, 63, 380, 384 and 5184

Exercise 33: Factor out the numbers 72, 31, 300, 625, 2000, 2187 and 15925

Exercise 34:

a) Determine if the numbers 150, 225, 7568, 9042, 35420 and 91 are divisible by 2, 3, 5, 10 and 11. Are any of them prime numbers? Why?

b) Factor them out

Exercise 35: Work out:

a) lcm (15, 40) =
b) lcm (16, 64) =
c) lcm (36, 90) =
d) lcm (60, 84) =
e) lcm (52, 40) =
f) lcm (28, 36, 126) =

Exercise 36: Work out:

a) hcf (105, 231) =
b) hcf (120, 144) =
c) hcf (30, 49) =
d) hcf (480, 600) =
e) hcf (25, 81)=
f) hcf (36, 72, 108) =

Exercise 37: Work out:

a) lcm (24, 60) =
b) hcf (50, 32) =
c) hcf (36, 54) =
d) lcm (12, 50, 63) =
e) hcf (28, 84, 70) =
f) lcm (24, 50, 28) =

Exercise 38: An ice cream truck visits Jeannette's house every twelve days and another ice cream truck visits her house every fifteen days. If both trucks visited today, when is the next time they will coincide?

Exercise 39: Tours for Cazorla leave every sixty minutes and tours for Baeza every ninety. When do the tours leave at the same time?

Exercise 40: I have forty-five mint candies and sixty strawberry candies. I want to pack them so that I have as many boxes as possible, all identical and with as many candies as possible. How many boxes can I get? What's the composition of each box?

Exercise 41: I have seventy five pineapple juice boxes, sixty orange juice boxes and forty-five apple juice boxes. I want to divide them in packs as big as possible, all with the same number of boxes but without mixing different flavors. How many boxes can I place in each pack? How many packs do I have in total?

Exercise 42: I take a bus that stops at the bus stop every eight minutes, while my cousin takes another bus that stops every twelve minutes at the same place. If we both took the bus this morning at eight o'clock, what's the next time the buses will coincide?

Exercise 43: A NGO wants to deliver goods amongst families with problems due to the crisis. They have 600 bricks of milk, 200 bottles of olive oil and 350 kg of cereal. What's the maximum number of boxes that they make so that they have as many goods as possible and they are all identical? What's the composition of each box?

Exercise 44: Mrs. Hernandez waters one of her plants every 10 days and another plant every 14 days. If she waters both plants today, when is the next time both plants will be watered on the same day?

Exercise 12: A truck is carrying 12 identical pallets that have a combined weight of 2496 kilos. How much does each pallet weigh?

Exercise 13: A company pays 8640€ to rent an office for six months. Supposing that each month has a total of 30 days, how much money does the company pay each day?

Exercise 14: Laurent is organizing the food for a party. He needs enough sausages and bread rolls to make 31 hot dogs. He buys 4 packs of 8 sausages and 5 packs of 6 bread rolls. Has he bought enough packs to make all the hot dogs? Is there any ingredient missing? What else does he need?

Exercise 15: Alan cycles to work every day, a six miles trip from home. How many miles does he travel in a year? Justify your answer.

Exercise 16: Bill buys a second-hand television set for 156€. He pays 25€ for some repairs and sells it for 191€. What's the profit?

Exercise 17: Find two numbers:

a) with a product of 20 and a difference of 1
b) with a sum of 7 and a product of 12
c) with a sum of 8 and a quotient of 3
d) that add to 15 and whose product is 42

Exercise 18: Indicate if the following statements are true or false and why

a) Forty-nine is a multiple of seven
b) Twenty-five is a divisor of five
c) Thirty is a multiple of nine
d) Twelve is a multiple of twenty-four
e) Seven is a divisor of one hundred and five

Exercise 19: Write the first four multiples of thirteen

Exercise 20: Write five multiples of nine that are greater than two hundred

Exercise 21: Write the first three multiples of twelve that are greater than ninety-six

Exercise 22: Write three multiples of eleven between thirty and fifty

Exercise 23: Determine if the following statements are true or false, and why.

a) 13640 is a multiple of 5, 10 and 11
b) 7 is a divisor of 63
c) 9 is a divisor of 42
d) 17 is a multiple of 51
e) 165 is a multiple of 3 and 5
f) 11 is a divisor of 45694

Exercise 24: Determine if the following statements are true or false, and why.

a) 13640 is a multiple of 5, 10 and 11
b) 7 is a divisor of 63
c) 9 is a divisor of 42
d) 17 is a multiple of 51
e) 165 is a multiple of 3 and 5
f) 11 is a divisor of 45694

Exercise 25: Find the value of the digit x so that the following numbers:

a) 78654x is a multiple of 2
b) 8x237 is a multiple of 5
c) 54739x is a multiple of 3
d) 73x42 can be divided by 5
e) 9423x can be divided by 11
f) 7x821 can be divided by 3