Mathematics
Grade 8

TOPIC:
Whole Numbers

Section A: Properties of Whole Numbers

1. State which property is illustrated in each case:

a) $15 + 28 = 28 + 15$

b) $(5 \times 8) \times 3 = 5 \times (8 \times 3)$

c) $7 \times (10 + 4) = (7 \times 10) + (7 \times 4)$

d) $45 + 0 = 45$

e) $126 \times 1 = 126$

2. Complete the following statements:

a) Any number divided by 0 is

b) The identity element for addition is

c) The identity element for multiplication is

3. Use properties to simplify the following calculations:

a) $25 \times 17 \times 4$

b) $58 + 97 + 42$

c) $8 \times 45 = 8 \times (40 + 5)$

4. In each of the following number sentences, replace the * with > , < or =

a) $3 + 8 * 8 + 3$

b) $2 + 5 \times 3 * 17$

c) $2 + 5 \times 3 * 21$

d) $3 + 3 \times 3 * (3 + 3) \times 3$

e) $10 - 4 \times 2 * (10 - 4) \times 2$

f) $8 * 2 + 2 \times 2$

g) $20 \div 5 \times 2 * 20 \div (5 \times 2)$

h) $36 \div (6 \div 2) * 36 \div 6 \div 2$

i) $2 + 2 * 2 \times 2$

j) $3 + 3 * 3 \times 3$

k) $3 \div 3 * 3 - 3$

l) $0 \times 50000 * 0 * 500$

Section B: Calculations with Whole Numbers

1. Solve the following using column methods:

a) $3\,578 + 2\,946$

b) $8\,205 - 3\,768$

c) 347×28

d) $5\,824 \div 16$

2. Use estimation to determine which answer is most reasonable:

The product of 48×52 is closest to:

A) 2 000 B) 2 500 C) 3 000 D) 3 500

3. Calculate using the most efficient method:

a) $999 + 567$ b) $502 - 298$ c) 25×36

Section C: Multiples and Factors

1. Write down the number(s) described.

a) All the factors of 72.

b) The multiples of 5, greater than 5 and less than 100.

c) The prime numbers between 20 and 40.

d) The composite numbers between 10 and 30.

e) The factors of 24 that are prime numbers.

f) The factors of 36 that are composite numbers.

g) The only even prime number.

2. Write the following as products of prime factors:

a) 180 b) 252 c) 420

3. Find the HCF and LCM of the following pairs:

a) 72 and 108 b) 144 and 180

4. The HCF of two numbers is 18 and their LCM is 360. If one of the numbers is 72, what is the other number?

Additional HCF and LCM Questions

5. Find the HCF and LCM of 72 and 120 by prime factorization.

6. Find the HCF of 210 and 315 by inspection.

7. Two numbers have an LCM of 180 and an HCF of 6. One of the numbers is 30. Find the other number.

8. Three numbers are 24, 36, and 60. Find their:
   a) HCF
   b) LCM

9. Find the smallest number that is divisible by 8, 12, and 18.

10. The LCM of two numbers is 84 and their product is 588. Find the HCF.

11. Find the HCF of 144 and 160 using the Euclidean algorithm.

12. A clock chimes every 12 minutes and a bell rings every 30 minutes. After how many minutes will they ring together again?

13. Find the HCF and LCM of 98 and 140 by listing the multiples and factors.

14. Two numbers are in the ratio 5:8, and their HCF is 9. Find the numbers.

Section D: Problem Solving with Whole Numbers

Ratio:

1. Write the ratio of 24 to 36 in simplest form.
2. John walks 2 km to school and Thabang walks 800m. Express the ration of John's distance to Thabang's distance as a ratio, in its simplest form.
3. Share R2 400 among three people in the ratio 3:5:8.
4. Two numbers are in the ratio 5:7. If the smaller number is 20, what is the greater number?
5. A car travels 420 km in 5 hours. What is its average speed (rate)?
6. If the ratio of boys to girls in a class is 4:5 and there are 36 students, how many are girls?

Rate:

7. If a car drives 300 km in 2 hours, determine the speed in km/h.
8. A car travels at 60 km/h.

   a) How long does it take to travel 240 km?

   b) How far will the car travel in 5 hours?

   c) Convert this rate (60 km/h) to a rate measured in m/s.
9. My car can travel 10 km on every litre of petrol. How much petrol will I need to drive 400 km?

Currency / Exchange rate:

10. If R1 = $0,055, how many dollars will you get for R3,600?
11. Given the exchange rate: $1 = R17,47

    a) How many rands will you get for $50?

    b) How many dollars will you get for R500?
12. A calculator costs £12,80. You buy it over the internet and so you have to pay £3,30 for delivery and other costs. You end up paying R289,32. What is the exchange rate for a pound in rands? (£1 = R?)

Percentages:

13. Determine:

    a) 25% of 120

    b) 150% of R45
14. An item is bought for R80 and sold at a profit of 20%. What price is the item sold for?
15. Thabo sells stationery, usually at a profit, but a certain batch of pens has been on his shelves for too long and he now decides to sell them at a loss of 40% to get rid of them. He bought the pens for R8 each. What will he sell them for?
16. A jacket originally costs R850. It is on sale with a 15% discount. Calculate:

    a) The discount amount

    b) The sale price

    c) The price including 15% VAT

17. The price of an item, including 25% profit, is R800. Determine the cost price (excluding profit).

18. Joshua buys pencils for R3,20 each and then sells them for R5,60 each. What percentage profit does he make?

19. Josi-traders buys boxes of hamburger patties at R40 each. They add a profit of $66\frac{2}{3}$ % and then they have to add 15% VAT on this increased price.

    a) What is the selling price of the boxes, excluding VAT?

    b) What will the buyer pay for a box, including VAT?

20. Vusi's stationers buy staplers for an amount at wholesale and then add a profit of 50%, followed by 15% VAT. He then sells the staplers for R34,20. What did he originally buy the staplers for?

Simple interest:

21. Jan borrows R500 from Bhavik. After a year, Jan pays back the money, plus 20% simple interest per month. How much does he pay?

22. Calculate the simple interest on R8 000 invested for 3 years at 6% per annum.

23. Bob invests R5 000 for 3 years at 8% p.a. simple interest.

    a) What is the interest earned over the 3 years?

    b) What is the total value of Bob's investment after 3 years?

Hire purchase:

24. Sheila wants to buy a refrigerator for R1 200. She cannot afford to pay all at once, so she buys it on hire purchase. According to the agreement, she will pay back the money, plus 10% simple interest per year, by means of monthly payments, over a one-year period.

    a) Calculate the total amount of money she'll have to pay.

    b) Calculate her monthly payment.

25. Siphe buys a car costing R160 000 on hire purchase. He makes a R40 000 deposit and pays back the balance, with 18% p.a. simple interest, over a period of 54 months.

    Calculate his monthly payment.

26. A laptop costs R12,000 cash or a 20% deposit plus 24 monthly instalments of R480. How much more does the hire purchase option cost?

Additional Financial Mathematics Questions

27. A jacket costs R850. The store offers a 20% discount. Calculate the sale price.

28. If a shop buys a bicycle for R1 200 and sells it at a 15% profit, what is the selling price?

29. A retailer buys goods for R8000 and sells them with a 12,5% profit. Calculate the profit and the selling price.

30. VAT of 15% is added to the price of an electronic gadget that costs R2 500. Calculate the price including VAT.

31. A family has a monthly budget of R15 000. If 40% is spent on housing, 25% on food, and 15% on transport, how much money is left for other expenses?

32. Calculate the simple interest on a loan of R10 000 at 9% per annum for 4 years.

33. A hire purchase agreement is taken for R6000 with a deposit of R1200 and 10 equal monthly instalments. What is the amount of each instalment?

34. Convert the total cost of an imported item priced at $300 if the exchange rate is 1 USD = 18 ZAR.

35. A trader sells vegetables for R2 500 but incurs a loss of 10%. What was the cost price?

36. John invested R5 000 in a savings account that earns 6% simple interest per year. How much interest will he earn in 5 years?

37. A product marked at R1 500 is sold with a 25% markup. Then a 10% discount is given on the marked price. Calculate the final selling price.

CAPS CLARIFICATION

WHOLE NUMBERS

Properties of whole numbers

- **Revise:**
  - The commutative; associative; distributive properties of whole numbers
  - 0 in terms of its additive property (identity element for addition)
  - 1 in terms of its multiplicative property (identify element for multiplication)
  - Recognise the division property of 0, whereby any number divided by 0 is undefined

Calculations using whole numbers

- **Revise:**
  - Calculations using all four operations on whole numbers, estimating and using calculators where appropriate

Calculation techniques

- Use a range of strategies to perform and check written and mental calculations with whole numbers including:
  - estimation
  - adding, subtracting and multiplying in columns
  - long division
  - rounding off and compensating
  - using a calculator

Multiples and factors

- **Revise:**
  - Prime factors of numbers to at least 3-digit whole numbers
  - LCM and HCF of numbers to at least 3-digit whole numbers, by inspection or factorisation

Solving problems

- Solve problems involving whole numbers, including:
  - Comparing two or more quantities of the same kind (ratio)
  - Comparing two quantities of different kinds (rate)
  - Sharing in a given ratio where the whole is given
  - Increasing or decreasing of a number in a given ratio
- Solve problems that involve whole numbers, percentages and decimal fractions in financial contexts such as:
  - Profit, loss, discount and VAT
  - Budgets
  - Accounts

- Loans
- Simple interest
- Hire Purchase
- Exchange rates