

1. Equations

1. Solve the simultaneous equation (3 mks)

$$\begin{aligned}2x - y &= 3 \\ x^2 - xy &= -4\end{aligned}$$

2. A photograph is mounted on a frame that it leaves a uniform border at the bottom and at the top. At each side a uniform border which is half the border at the bottom is left.

If the side of the square photograph is 5cm and area of frame is 75cm^2 .

- (a) Write down an equation for the area of the frame (simplified) (2mks)
(b) What are the dimensions of the frame? (4mks)
(c) What is the percentage area of the frame that is not covered by the photograph? (4mks)
3. Solve the equation $\frac{1}{4x} = \frac{5}{6x} - 7$ (3mks)
4. Factorize completely: $75x^2 - 27y^2$ (2mks)
5. Solve for x given that $\frac{x-3}{5} = 4 - \frac{x-2}{2}$ (3mks)
6. Solve for x and y in. (4mks)

$$\begin{aligned}2^{2x-3y} &= 16 \\ 5^{x-2y} &= 1\end{aligned}$$

7. The attendance at a party consisted of 35 men, a number of women and some children. The number of women was one and a half times that of the children present.

- a) If there were a total of 65 participants, how many women attended the party? (2mks)
- b) During the party, each child took one bottle of soda, the men took two bottles each while some women took two and others three. Given that five crates each containing 24 bottles of soda were consumed, how many women took two bottles of soda? (6mks)
- c) Each crate of soda was bought for sh.432 plus a deposit of sh.10 per bottle incase it broke. How much money did the party organizers pay at the soda depot? (2mks)

8. Simplify the expression (3 marks)

$$\frac{p^2 - 4m^2}{2m^2 - 7mp + 3p^2}$$

9. During a certain ceremony goats and chicken were slaughtered. The number of heads (for both chicken and goats) was 45. The total number of legs was 100. Determine the exact number of goats and chicken slaughtered. (3 marks)

10. A tailor bought a number of suits at a cost of Sh. 57,600 from Ken-suit wholesalers. Had he bought the same number of suits from Umoja wholesalers, it would have cost him Sh. 480 less per suit. This would have enabled him to buy 4 extra suits for the same amount of money.
- (a) Find the number of suits the tailor bought (4 marks)
- (b) The tailor later sold each suit for Sh. 720 more than he had paid for it. Determine the percentage profit he made? (4 marks)
11. Use factor method to evaluate the following expression leaving your answer as a product of prime factors in power form.

$$(13824 \times 0.000125)^{\frac{1}{3}} \quad (3\text{mks})$$

12. Solve for x in the given equation. (3mks)

$$64^x - 121 = 7 - 4^{3x}$$

13. Given the $4x = 3y$, evaluate $\frac{\frac{1}{3}x^2 - 4xy + y^2}{4x^2 + y^2}$ (4mks)

14. Find the value of y in the equation

$$\frac{243 \times 3^{2y}}{729 \times 3^y \div 2^{(2y-1)}} = 81 \quad (4\text{mks})$$

15. Factorise completely the expression $45a^2 - 20b^2$ and hence or otherwise find its value when $a = 5$ and $b = 3$ (3mks)

16. Simply $\frac{3^{n+3} - 3 \times 3^n}{4 \times 3^{n+2}}$ (3mks)

17. Find the value of M in the following equation. (3 mks)

$$\left(\frac{1}{27}\right)^M \times \left(81\right)^{-1} = 243$$

18. Rotich bough 4 pencils and 6 pens for kshs. 184 and Kamau bought 3 pencils and 8 pens of the same type at kshs 222. Find the price of each item. (3 mks)
19. A 60m by 80m parking lot is torn up to install a side walk of uniform width around its perimeter. The new area of the parking lot is two thirds of the old area. How wide is the side walk? (4 mks)
20. Mukku bought 4 text books and 3 novels at total cost of sh. 4250. if he had bought 2 text books more and one novel less, he would have spent sh. 250 less. On another occasion makku bought 3 text books and 3 novel at the same prices, find how much he spent in the second occasion. (4 marks)
21. A Kenyan businessman US\$100 to a company in the United States of America. The Kenyan can either pay through his account in Kenya or through his account in the United Kingdom. Which method is cheaper and by how much? Give your answer in Kenya shillings given that;
 1 US dollar = 76.84 Kenya shillings
 1 Sterling Pound = 1.53 US dollars
 1 Sterling pound = 115.70 Kenya shillings
22. Foreign exchange on 27/5/2010 was given as follows:.

| Currency | Buying (Kshs) | Selling (Kshs) |
|----------|---------------|----------------|
|----------|---------------|----------------|

| | | |
|------------------|--------|--------|
| 1 Euro | 84.15 | 84.26 |
| 1 Sterling pound | 118.35 | 121.47 |
| | | |

A tourist came to Kenya from London with 6000 Euros which he converted to Kenya shillings at a bank. While in Kenya he spent a total of Kshs.300,000 then converted the balance into sterling pounds at the Same bank. Calculate the amount in sterling pounds he received.

23. A Kenyan football fan visited South Africa from Kenya. He changed his currency from Kenya shillings to South African rand. The exchange rates in Kenya were as per the table below:-

| | |
|---------------|----------------|
| Buying | Selling |
| 9.9399 | 10.0166 |

He has a total of shs.2, 8000,265 and must spend 13 days. During his stay, he spent 8900 Rands on food and accommodation, 97,000 Rands on a return air ticket and 53689 Rands on entertainment. On his return, he converted the remaining amount into Kshs. How much did he receive to the nearest cents?

24. A French tourist changes 3000 Francs into Kenyan shillings at 1 Franc = Kshs.1.89. He spends shs.4695, then exchanges the remaining shillings back into Francs at 1 Franc =1.95. How many Francs does he receive?

25. Hamisi arrived in Nairobi from USA with 40 travelers cheques each with 75 US dollars. How much does she receive in Kshs from the bank on a day when 1 US dollar was equivalent to Kshs 81.40 and the bank charges commission at the rate of Kshs.100 per travelers cheque

26. A Kenya bank buys and sells foreign currencies as shown below

| | Buying in Kshs. | Selling in Kshs. |
|----------------------|------------------------|-------------------------|
| 1 Hong Kong dollar | 9.74 | 9.77 |
| 1 South African rand | 12.03 | 12.11 |

A tourist arrived in Kenya with 105,000 Hong Kong dollars and changed the amount to Kenya shillings. While in Kenya, she spent Shs.403,879 and changed the balance to South African rand before leaving for South Africa. Calculate the amount, in South African rand that she received

27. A Japanese tourist entered Kenya with Kshs.500,000 Japanese Yen which he converted to Kenya currency. While in Kenya, he spend Kshs.16200 in all. He then converted all the remaining money into Euros before leaving for Italy. If he carried out all his transactions at the Stanbic bank using rates shown below, calculate to the nearest Euro, how much money he left Kenya with. (*Do not use mathematical tables for this question*)

| | Selling (Kshs) | Buying Kshs |
|-------------------------|-----------------------|--------------------|
| 100 Japanese Yen | 66.35 | 66.05 |
| 1 Euro | 78.15 | 77.85 |

28. Do not use mathematical tables in this question. Equity bank buys and sells foreign currencies as shown:-

| | Buying (Kshs.) | Selling Kshs. |
|----------------------|-----------------------|----------------------|
| 1 US dollar | 77.43 | 78.10 |
| 1 South African Rand | 9.03 | 9.51 |

A tourist arrived in Kenya with 5,600 US dollars and changed the whole amount to Kenya shillings while in Kenya he spend shs.201,367 and changed the balance to South African rand

before leaving to S. Africa . Calculate the amount in S. African rand that she received

29. A tourist arriving from Britain had UK £ 9000. He converted the pounds to Kenyan shillings at a commission of 5%. While in Kenya he spent $\frac{3}{4}$ of his money. He exchanged the remaining to US dollars with no commission. Calculate to the nearest US dollars the amount using the exchange rate below.

| Currency | Buying Kshs. | Selling Kshs. |
|-------------|--------------|---------------|
| 1 US Dollar | 63.00 | 63.20 |
| 1 UK Dollar | 125.30 | 125.95 |

30. A company was to import goods worth Kshs.100,000 from U.K and changed the money to Sterling pounds. The company later realized that it was cheaper to import the same goods from U.S.A and changed the sterling pounds to dollar. Unfortunately the transaction failed and the money was converted to Kenya shillings. How much money did the company end-up with, given that;
 1 US dollar = Kshs.78
 1 Sterling pound = Kshs.120
 1 Sterling pound = 1.79 U.S dollar

31. A tourist arrives in Kenya from England with S.£ 50,000 and uses the money to buy Kenya shillings. He quickly changes his mind and sells the Kenya shillings to get back his s£. How much money in S.£ did he get? Use the table below

| | buying | selling |
|------------------|----------|----------|
| 1 Sterling pound | 120.7131 | 120.9294 |

32. A Kenyan bank buys and sells foreign currencies at the exchange rates shown below:

| | Buying (Kshs.) | Selling (Kshs.) |
|-------------|-------------------|--------------------|
| 1 Euro | 147.86 | 148.00 |
| 1 US Dollar | 74.22 | 74.50 |

An American arrived in Kenya with 20000 Euros. He converted all the Euros to Kenya shillings at the bank. He spent Kshs.25100 200 while in Kenya and converted the remaining Kenya shillings into US Dollars at the bank. Find the amount in dollars that he received

33. Simplify;
 (a) $6a - 2b + 7a - 4b + 2$
 (b) $\frac{2x - 2}{2x} - \frac{3x + 2}{4x}$