2. Equations

1	$2x - 3 = y$ $x^2 - x(2x-3) = -4$ $x^2 - 2x^2 + 3x = -4$ $-x^2 + 3x + 4 = 0$ $x^2 - 3x - 4 = 0$ $-4, +1$ $x^2 - 4x + x - 4 = 0$ $x(x-4) + 1(x-4) = 0$ $(x+1)(x-4) = 0$ $x = 4$ $x = -1$ When $x = 4\ y = 5$ $x = -1\ y = -5$	M_1 M_1 A_1 B_1	✓partial fact or equivalent ✓both answers of x or y ✓both answers
		4	
2.	Length of the frame (x + x + 5) = (2x + 5) Width of the frame (½ x + ½ x + 5) = (x + 5) Area = (2x + 5)(x + 5) (a) 75 = 2x2 + 10x + 5x + 25 2x2 + 15x – 50 = 0 (b) 2x2 + 15x – 50 = 0 2x2 + 5x + 20x – 50 = 0 x(2x – 5) + 10(2x – 5) = 0 (x + 10)(2x – 5) = 0 x = -10 or 2 ½ length (2 x 5/2 + 5) = 10cm width (5/2 + 5) = 7.5cm (c) Area not covered = area of frame – area of photo = 75 – 25 = 50cm2 % area = 50/75 x 100 = 66.67%/66 2/3%	B1 M1 A1 M1 A1 B1 B1 M1 M1 A1	Dimension with unknowns Factorization Difference in area
		10	

3.	$24x\left(\frac{1}{4x}\right) = 24x\left(\frac{5}{6x}\right) - 7(24x)$ $6 = 20 - 168x$ $\frac{-14}{-168} = x$ $\frac{1}{12} = x$	M1 M1 A1	Multiplication by LC.
4	3(25x2 – 9y2) 3(5x – 3y) (5x + 3y)	M1 A1 2	For 3 out
5.	$\frac{x-3}{5} = 4 - \frac{x-2}{2}$ $10\left(\frac{x-3}{5}\right) = 10 \times 4 - 10\left(\frac{x-2}{2}\right)$ 2(x – 3) = 10(4) – 5(x – 2) 2x – 6 = 40 – 5x + 10 7x = 56 x = 8	M1 M1 A1	
		03	

8. $\frac{(p + 2m)(p - 2m)}{2m - p\ m - 3p}$ B1 √ factors for numerator
B1 √ factors for denominator

$= \frac{-\ p + 2m}{m - 3p}$ B1

3

9. Let of goats be a
." ." chicken be b

a + b = 45
4a + 2b = 100 } B1 for both equations

a + b = 45
-2a + b = 50 M1 method for solving any of the unknown

-a = -5
a = 5
b = 40

Goats were 5 }

Chicken were 40 A1
3

10. Ken – suit;
Let the number of suits bought be x and the cost per suit be y

Then xy = 57600
$y = \frac{57600}{x}$ M1 Eq

Umoja
No. of suits bought is (x + 4)
Cost per suit is (y – 480)

= P(x + 4) (y – 480) = 57600 M1 Eq
$y = (x + 4)(\frac{57600}{x} - 480$ M1 Sub of y
$-480x^2 - 1920 + 230400 = 0$

$x^2 + 4x - 480 = 0$ M1 formation of quadratic eq

(x – 20) (x + 24) = M1 fact
No of suits = 20 A1

(b) Cost per suit = $\frac{57600}{20}$ M1 exp of cost

Sh. 2880 A1

Profit per suit = Sh. 720

∴ % profit = $\frac{720}{2880} \times 100$ M1 exp

= 25% A1
10

11.	$13824 = 2^9 \times 3^3$ $0.000125 = \frac{1}{8000} = \frac{1}{2^6 x 5^3}$ $\therefore = \left(\frac{2^9 \times 3^2}{2^6 \times 5^3}\right)^{-\frac{1}{3}}$ $= \left(\frac{2^6 \times 5^3}{2^9 \times 3^3}\right)^{\frac{1}{3}}$ $= \left(\frac{5}{2 \times 3}\right)$	M1 M1 A1	 Reciprocal Prime products
		03	
12.	$64^x + 4^{3x} = 128$ $(4^3)^x + 4^{3x} = 128$ $4^{3x} + 4^{3x} = 128$	 M1	

	$2(4^{3x}) = 128$ $4^{3x} = 64 = 4^3$ $\therefore 3x = 3$ $X = 1$	M1 A1	
		03	
13.	$4x = 3y \Rightarrow y = {}^4/_3\, x$ $\dfrac{\frac{1}{3}x^2 - 4x\left(\frac{4}{3}x\right) + \left(\frac{4}{3}x\right)^2}{4x^2 + \left(\frac{4}{3}x\right)^2}$ $= \dfrac{\frac{1}{3}x^2 - \frac{16}{3}x^2 + \frac{16}{9}x^2}{4x^2 + \frac{16}{9}x^2}$ $= \dfrac{-\frac{29}{9}}{\frac{52}{9}} \qquad = -\dfrac{29}{52}$	 **M1** **M1** **M1** **A1**	x = ¾ y For ✓subst For ✓ num For ✓ den
		04	
14.	$\dfrac{3^5 \times 3^{2y}}{3^6 \times 3^{y-2y+1}} = 3^4$ $\dfrac{3^{5+2y}}{3^{7-y}} = 3^4$ $y = 2$	**M1** **M1** **A1**	For ✓ factorization For ✓ simplification
		03	
15.	$5(9a^2 - 4b^2)$ $5(3a-2b)(3a+2b)$ *When* $a = 5; b = 3$ $= 5(3\times5 - 2\times3)(3\times5 + 2\times3)$ $= 5(15-6)(15+6)$ $= 5\times9\times21$ $= 945$	**B1** **M1** **A1**	For ✓ simplied factorization ✓ substitutes and simplification
		03	
16.	$\dfrac{3^3 \times 3^n - 3\times3^n}{4\times3^2\times3^n}$ $\dfrac{3^n(27-3)}{3^n \times 36}$ $\dfrac{24}{36}$ $\dfrac{2}{3}$	**M1** **M1** **A1**	 Condone 0.667

		03	

17.	$27^{-m} \times \frac{1}{81} = 243$ $(3^3)^{-m} \times \frac{1}{3^4} = 3^5$ $3^{-3m-4} = 3^5$ $-3m - 4 = 5$ $-3m = 9$ $m = -3$	 M1 M1 A1 3	 Exp. in powers of 3 Equating powers of 3
18.	$4p + 6q = 184 \ldots x3$ $3p + 8q = 222 \ldots x4$ $12p + 18q = 552$ $12p + 32q = 888$ $\frac{14q}{14} = \frac{336}{14}$ $q = 24$ $4p + 144 = 184$ $4p = 40$ $P = 10$	 M1 M1 A1 3	 Formation of Equation Elimination of p or q or equivalent In both

19.	Old area = $80 \times 60 = 4800m^2$ New area = $(80 - 2x)(60 - 2x) = 2$ $\Rightarrow 4x^2 - 280x + 4800 = 2/3 \times 4800$ $4x^2 - 280 + 1600 = 0$ $X = 6.28m$	M1 M1 M1 A1	✓old area ✓ exp ✓solving CAO
		04	

20	$4t + 3n = 4250$ $6t + 2n = 4000$ $3t + n = 2000$ $9t + 3 = 6000$ $4t + 3n = 4250$ ——— 5t =350 n=2000-1050 = 950 $3\times350+3\times950=3900$	B1 M1 A1 B1	2 equations solving For t and n

21. *Through A/C in Kenya*
1000000 X 76.84 = Shs.7684000
through A/C in UK
1000000 X 115.70 = Shs.7,562,091.15
1.53
Through UK less by
768400 – 7562091.85 = 121,908.85

22. *6000 turn _____ 6000 X 84.15*
= Kshs.504900
Balance = 504900 – 300000
= 204900
∴ sterling pound = $^{204900}/_{121.47}$
= 1686.8

23. *In Rand = 2800265 = 279562.4264*
10.0166
Expenses = (115,700 + 97000 + 53689)
= 266389 Rand
Remainder = 279562.4264
266,389.000
13, 174.4264
Amount in Kshs. = 13174.4264 x 9.9399
= 130,942.50

24. *Kshs. (3000 x 1.89) = 5670*
Remain = 5670 – 4695 = 75
Francs =(975) = 500
1.95

25. *Amount in dollars = 75 x 40 = 3,000*
Amount in Ksh = 3000 x 81.40 = 244,200/=
Less commission 4,000

Total received *sh 240,200*

26. *Hong Kong 8105,000 x 9.74 = ksh.1022700*
Amount spent in Kenya = 403879
Balance = 1,022,600 – 403,879 = 618,821
Amount in South Africa = $\frac{618821}{12.11}$ = 51100rands

27. *500000 J yen into Kshs.= ($\frac{500000}{100}$ x 66.5)*
= Kshs. 330,250
Amount spend in Kenya= Kshs. 16200
Remained with Kshs. (330250 – 16200)
= Kshs. 314,040
Kshs. 314040 into Euros:
= ($\frac{314040}{78.15}$)
= 4,018.554063Euros
He left Kenya with = 4,019 Euros (nearest Euro

28. *1 $ ——— Kshs. 77.43*
5600$ = (5600 x 77.43)
= 433608
Spent 201,367
Remainder = (433608 – 201367)
= 232241
1SR _____shs.9.51
Shs.232241
$\left(\frac{1 \times 232241}{9.51}\right)$
= shs.24420.715

29. *1UK £ = 125.30*
9000 UK £ = 125.30 x 9000
= 1,127,700
Commission = 5/100 x 1,127,700 = 56,385
He got 1,071,315
Expenditure = ¾ of 1,071,315 = 803,486.25
Amt. left = 267,828.75
In US $ = $\frac{267,828.75}{63.20}$
= 4237.7966 *≃ 4237 US $*

30. *1 sterling pound = Kshs.120*
? = Kshs.100000
$^{100000}/_{120}$ = 833.3 sterling pounds
1 sterling pound = 1.79 U.S dollars
833.3 = ?
= 833.3 x 1.79 = 1491.7 dollars
1 U.S dollar = Kshs.78

1491.7 dollars = Kshs?
1491.7 x 78 = 116350 Kenya shillings

31. *Amount received in Kenya shillings*
$= \frac{\sum 50{,}000 \times Shs.120.7131}{\sum} = Kshs.6035655$
Amount received in sterling pound
$= \frac{1 \sum x\ Kshs.6035655}{120.9294} = \sum 49910.568$

32. *Sh(20000 x 147.86) = sh.2957200*
To US Dollars $= \frac{44700}{74.5} = 6000$
He received 6000 US Dollars

33. *a) 6a + 7a – 2b – 4b + 2*
= 13a – 6b + 2

b) $\frac{2x-2}{2x} - \frac{3x+2}{4x} = \frac{2(2x-2)-(3x+2)}{4x}$
$= \frac{4x-3x-4-2}{4x}$
$= \frac{x-6}{4x}$