2. Further logarithms

1.

No	Log
1934^2	3.2865 X 2
$\sqrt{0.00324}$	= 6.5729
	-3.5105 : 2
	= 2.7553
	= 5.328
2.8727	0.4583
	= 4.8699
Anti log 4.8699 = 7.4114 X 10	
= 74114	

2. a) monthly taxable pay;

15% of monthly salary = $^{15}/_{100}$ x 20000

= kshs.3000

Monthly pay = Kshs.(20000 + 3000 – 700)

= Kshs. 22300

In Kenya pounds = $^{22300}/_{20}$

= KE 1115

b) Total tax payable (Gross tax)

1 – 342_____ 342x2 = Kshs.684

343 – 684 _____ 342 x3=Kshs.1026

685 – 1026 _____ 342 x4= Kshs.1368

1027 – 1368 _____ 89x5 = Kshs.445

Total tax = Kshs.3523

c) Net tax

= Gross tax – relief

= Kshs.(3523 – 600) = Kshs.2923

d) Net pay;

= Kshs.20000 – (2923 + 2100 + 200 + 2/100 x 20000)

= Kshs. (20000 – 5623) = Kshs.14377

3. 6 month depreciation rate = 8%

Number of periods = 8

$400{,}000\ (1 - 0.08)^8 = 205288$

4. Mid ordinate

Area = 1.2 (6.2 + 4.3 + 2.6)

= 15.72

5. $N.\ \log_{3^6} \frac{2^5 \times 2^7}{} = \log \frac{2^{12}}{3^6}$

$= \log \left(\frac{2^2}{3}\right)^6 = \left(\frac{4}{3}\right)^6$

$D;\ \log_{3^3} \frac{2^5 \times 2^1}{} = \log \frac{2^6}{3^3} = \log \frac{2^2}{3}^3 = 3\log \frac{4}{3}$

$N;\ \log \frac{4}{3}$

$\frac{D}{}^6$

3

$$= \frac{6 \log \frac{4}{3}}{3 \log \frac{4}{3}}$$

$= {}^{6}/_{3} = 2$

6. $\log_{(x+2)}(x+5) = \log_{(x+2)}(4)$

$x + 5 = 4$

$x + 2$

$(x+5)(x+2) = 4$

$x^2 + 2x + 5X + 10 = 4$

$x^2 + 7x + 6 = 0$

$x^2 + 6x + x + 6 = 0$

$x(x+6) + 1(x+6) = 0$

$(x+1)(x+6) = 0$

$x = -1 \quad x = -6$

7. $a = 100$

$r = \frac{200}{100} = 2$

$\frac{a(r^n - 1)}{r - 1} > Sn$

$\frac{100(2^n - 1)}{2 - 1} > 3{,}100$

$2^n - 1 > 31$

$2^n > 32$

$2^n > 2^5$

$n > 5$

$n = 6$

8. a)

2	3	5	7
2	32	52	72
3	23	53	73
5	25	35	75
7	27	37	57

b) $P(E) = \frac{4}{16}$

$= ¼$

9. $x^2 + y^2 - 6x = 3 - 4y$

$x^2 - 6x + ({}^{6}/_{2})^2 + y^2 + 4y + ({}^{4}/_{2})^2 = 3 + ({}^{6}/_{2})^2 + ({}^{4}/_{2})^2$

$(x-3)^2 (y+2)^2 = 3 + 9 = 4$

$(x-3)^2 (y+2)^2 = 16$

$C(3, -2)$

Gradient $\frac{\Delta y}{\Delta x} = \frac{7 - -2}{6 - 3} = 3$

10. $A = P(1 + \frac{r}{\ })^n$

$$= 10000\left(1 + \frac{4}{100}\right)^6$$

$$= 10000(1.04)^6$$

$$= 12653.19 \quad (12,653)$$

11.

No.	Std. Form	Log
13.6	1.36×10^1	1.1335
	+	
$\cos 40^0$	—	1.8842
		1.0177
63.5	6.35×10^1	1.8028
		1.2149 ÷3
		$= \frac{3}{33} + \frac{2.2149}{33}$
0.5474	5.474×10^{-1} ←	1.7383

0.5474

12. $\log_{10} 5^2 - \log_{10} 2^3 + \log 2^5$

$$\log_{10}\left(\frac{25 \times 32^4}{8_1}\right)$$

$\checkmark$ ***Application of logarithmic laws.***

$\checkmark$ ***Application***

C.A.O

$$\log_{10} 100 = \log_{10} 10^2$$

$$= 2 \log_{10} 10$$

But $\log_{10} 10 = 1$

$\therefore = 2$

13. $\log \frac{3x + 8}{2^3} = \log (x - 4)$

Division of logs.

$$\frac{3x + 8}{8} = x - 4$$

$$3x + 8 = 8(x - 4)$$

Dropping logs and simplification.

$$3x + 8 = 8x - 32$$

$$-5x = -40$$

$$x = 8$$

C.A.O