****

**MATHEMATICS MARKING SCHEME**

**PAPER 2**

**121/2**

**SECTION 1**

1.

|  |  |  |
| --- | --- | --- |
| no | stdform | Log |
| 05539 | 5.539 x 10-1 | T.7434 |
| 8.35 | 8.35 x 100 | 0.9217 + - |
| 23.68 | 2.368 x 101 | 1.3744 |
|  |  | 2.2961 |
|  |  | 3.4473 |
|  |  | 3 |
|  |  | =T.1491 |
| 10-1 x 1.4096=0.14096 |  |
|  |

2. 2x =

 4x2 =

 2 + y

 8

 7

2

600

 Sin 600 =

 x
 =

 =

4. a) (x + 4 = (x)4 + 4(x)3 () + 6 (x)2)2 + x()3 + ()4

 = x4 + 2x2 + 1 .5 + 2 + 4

 Constant term 1.5

5. y = kx2 +

 13 = 16k +

 26 = 32k + b

 79 = 81k +

 237 = 243k + b

243k + b = 237

32k + b = 26

 211k = 211

 K=1

 26 = 32(1) + b

 b= -6

 y=x2 -

6. a + d, a + 3d, a + 15d -> G.P

 -3 + d, -3 + 3d, -3 + 15d

 =

 (-3 + 3d)(-3 + 3d)= (-3 + d) (-3 + 15d)

 9 – 9d - 9d + 9d2 = 9 – 45d – 3d + 15d2

 6d2 - 30d = 0

 6d(d – 5) = 0

 d=0 or 5

 d=5

 y= = = 6

\*

7. 2 cos =

 Cos =

 = cos-1 () = 66.420,

But = 113.580 - 113.580

 0, -227.160

8. 2 - x + 2 + y =

 x2 - 2x + y2 + 2y = 7

 (x – 1)2 + (y + 1)2 = 7 + 1 + 1

 (x – 1)2  + (y + 1)2 = 9

 Centre (1, -1)

 Radius = = 3

9. (a)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| X | 0 | 300 | 450 | 900 | 1350 | 1500 | 1800 |
| Y=sin 2x | 0 | 0.866 | 1 | 0 | -1 | -0.866 | 0 |

9.(b) 

30 60 90 120 150 180 x

y=0.4

x=0.60, 840

 Y

 1

0.5

0

-0.5

-1

0

5

10

15

20

25

10.

3m + 2n = 12

4m - 2n = 5

 =

 Dot= -6 - 8 = -14

 = -

 =

 =

 m = =

 n = =

11. Gross tax =

 =£ 178.4

 1st £484 x = £ 48.4

 2nd £484 x = £ 68.4

 3rd £484 x = £ 61.6

 **£ 178.4**

 0.2x = 61.6

 X= £308

 Taxable salary = 484 + 456 + 308

 = K£ 1248 x 20

 = kshs.24,960

 Less H/all 5,000

 Basic salary Kshs. 19, 960

12.73500 - 7500 = 66 000

 Principal = 52 500

 Amount = 66 000

 66 000 = 52500n

 = 1.01875n

 1.2571 = 1.01875n

log 1.2571 = n log1.01875

 n = = 12.3

 n= 13 months

13. Let length = x

 width = = 50 - x

 A = x(50 - x)

 A = 50x - x2

 = 50 - 2x =0

 2x = 50

 X = 25

 max area = 25 (50 - 25)

 = 25 x 25

 = 625m2

14. l.s.f. = 2: 3

 A.s.f. = 4:9

 5 - 36

 4 - ?

= = 28.8 cm2

Vot = 28.8 x 10 = 288cm3

1cm3 -1.32g

288cm3 = ? = 288 x 1.32

 = 380.16g

15. 2= 3 – 2

Let = x

 x2 = 3 - 2x

 x2 + 2x - 3 = 0

 (x + 3)(x – 1) = 0

 X = -3 or 1

 = -3

 T=10-3 = 0.001

 Or = 1 -> t = 10

 T= 0.001 or 10

16.

 = = 3.62

 max = = 3.741

 min = = 2.874

 Error = x 100

 = 23.95%

17.

A

a

>

M

P

O

B

>

N

B2

 1

 1

 1

1. AB= Ao + OB

 = b - a

1. OM = +
2. AN = AO + ON

 =

 (b) OP = t om OP = OA + AP

 =t( + = a + 5 (

 = + t b = a +

 = (1 – s) a +

 t=

 T=2-2s …………….(1) t= x =

 s= t=

 3t = 2s………. (2)

 3(2 – 2s) = 2s

 6 – 6s = 2s

 6 =8s

 S= =

(c) AP=S AN

 AP= AN

 AP: PN = 3:1

 AN:NP=4:-1

18.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X | d=x-162 | + | C+ | td | td2 |
| 152157162167172 | -10-50510 | 1816242814 | 18245886100 | -180-800140140 | 180040007001400 |
|  |  | £=100 |  | £td=20 | £td2 4300 |

* (i) Mean =

 = 162.2

 (ii) S.d = - 2

30

154.5

18

159.5

34

 =

 = 6.554

(b)(i)New mean = 162.2 + 5

 = 167.2

 (ii) New s.d. = 6.554

(c) P30 = 30th

 =

 =

P30 – 154.5 =

P30 = 3.75 x 154.5

 = 158.25

19.

B

R

Y

R

Y

R

R

Y

A

Y

R

Y

R

Y

(b) (i) P (AYY or BYY)

 = x x + x x

 = + = = =

 (ii) P(ARY or BRY) = x x x x

 = + = =

(iii)P(ARY or BRY or AYR or BYR)

= x x + x x to = x x + x x

 = + + + = = =

 = 1 - x x - x x

 = 1 - -

 = = =

20. drawing

21. y=x2  - 4

1. = -4 A= ½ x ½ (4 + 5) + 2 (375 + 3 + 1.75+ 40 + 2.75

 = 3.75 = ¼ (9 + 21.5)

 = -3 = ¼ x 30.5 = 7.625 unit2

 = -1.75

 = 0

 = 2.25

 = 5

 A= ½ 3.375 + 3.4375 + 2.4375 + 0.9375 + 1.0625 + 3.5625

1. = -3.9375

= -3.4375 = ½ (15.375)

 = -2.4375 = 7.6875

 = -0.9375

 = 1.0625

 = 3.5625

C (i) A=

 = +

 = – 0 +

- + -3 +

 - +

 =

(ii) Absolute error = 7.6875 - 7.6660 = 0.0209

 % error = x 100 = 0.2726%

22.

1. 124 + 56 = 1800
2. 180 x 60 x cos kU = 8273.28 nm
3. 100 x 60 = 6000 nautical mile
4. Distance = speed x time

6000 = 200 kt

= 30 hours

Time difference = 12 hours

Between x and y

When it is 2.00p.m at y

time at x = 2.00 am

23. graph

24. (i) y = axn

 = + n

= + n

 (ii)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 0.301 | 0.477 | 0.602 | 0.699 | 0.778 |
|  | 0.6.2 | 1.35 | 1.795 | 2.11 | 2.35 | 2.55 |

 n=

 =

 =

 = 0.6

a= antilog 0,6 = 3.981

y=3.981x2.5

 when x=2 – 1

 y = 3.981 (2.1)2.5 = 25.44