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**MATHEMATICS PAPER 2 (121/2)**

**TRIAL 2, 2019**

**FORM FOUR**

**PAPER 2**

**TIME: 2½**

**MARKING SCHEME**

1. p² = x + 2w

4x + 3R M1

4p²x + 3p²R = x + 2w

4p²x – x = 2w – 3p²R

X(4p² - 1) = 2W – 3p²R M1

X = 2w – 3p²R

4p² - 1 A1

1. p = av² + bv³ : 4a + 8b = -20 M1

9a – 27b = 135

36a + 72b = -180

36a – 108b = 540

180b = -720 M1

B= -4

-20 = 4a +32

4a = -52

a = -13

p= -13V² + 4V³ A1

1. (1+2x)7 = 1 + 7 (I)6(2x)1 + 21(1)5 + 35(1)4(2x)3 B1

= 1 + 14x + 84x² + 280x³ + \_ \_ \_ \_

(1.02)7 = (1 + 0.02)7 = (1 + 2x) 7

2 x = 0.02 —› x = 0.01

Subst x = 0.01

(1.02)7= 1 + 14(0.01) + 84(0.01)² + 280(0.01)³ M1

= 1 + 0.14 + 0.0084 + 0.00028

= 1.14868

= 1.1487 (to 4d.p) A1

1. √2 – 1 x 4√2 + 3 = √2(4√2 + 3) – 1(4√2 + 3) M1

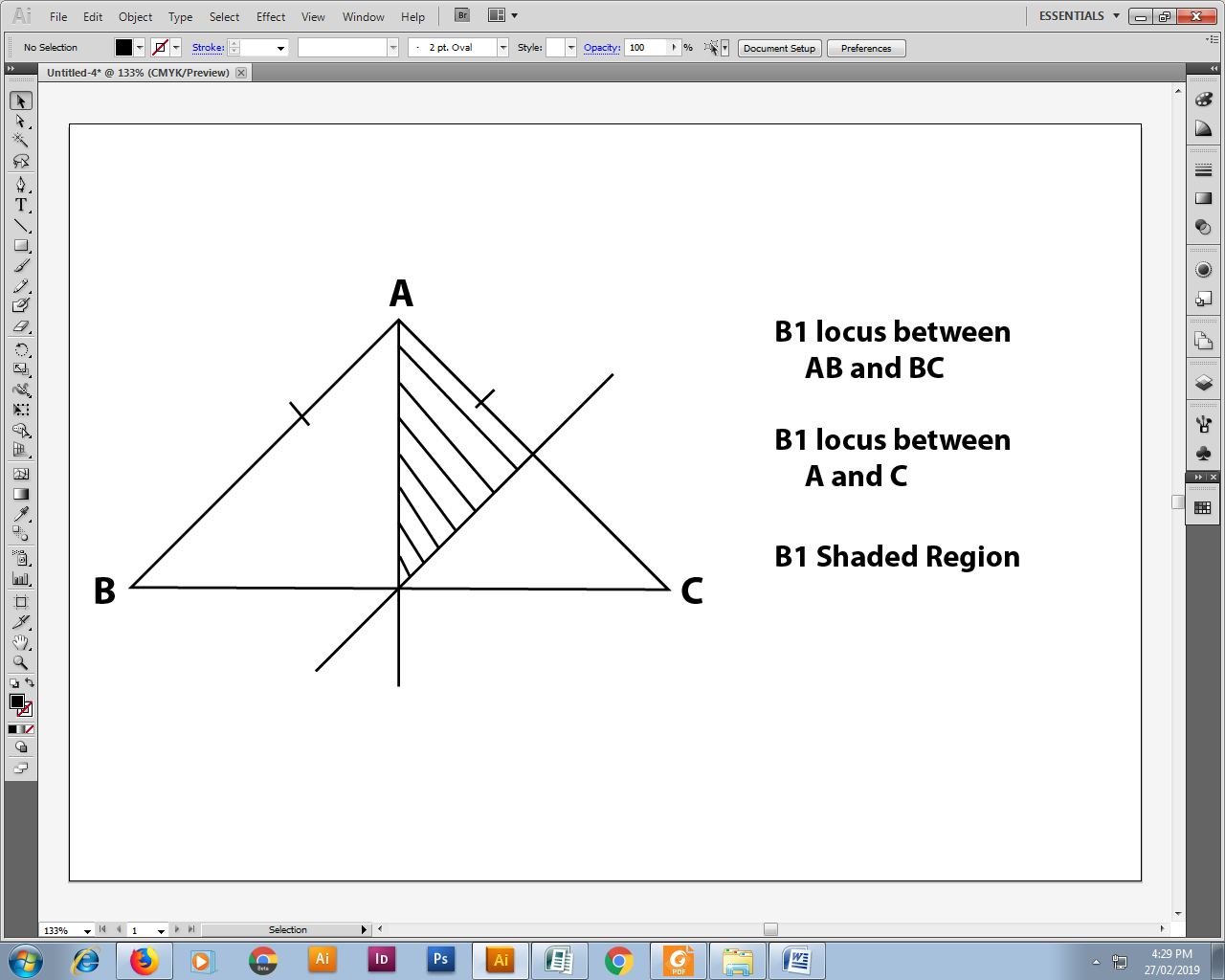
4√2 – 3 4√2 + 3 4√2(4√2 + 3) -3(4√2 + 3)

= 8 + 3√2 - 4√2 – 3

32 + 12√2 - 12√2 – 9 A1

= 5 - √2

23 A1

1. 
2. Max val of x 13.45min 13.35 B1

Max val of Y 4.35 min 4.25

Max vals of x 13.45 = 3.164y

4.25

Min value of x13.35 = 3.069

Y 4.35

Actual value of x13.4 = 3.1163 B1

y 4.3

Absolute error = 3.1642 – 3.069 = 0.04785

2

Percentage error = 0.04785 x 100 = 1.5355% A1

3.1163

1. A² = = M1

Let B be = a b

c d

9 8 = 1 2 + a b

16 14 4 3 c d

a + 1 = 9 a = 8

b + 2 = 8 b = 6 M1

c + 4 = 16 c = 12

d + 3 = 17 d = 14

B 8 6

12 14 A1

1. a) 6 x R = 4.8 x 5 M1

XR = 4.8 x 5

6

= 4 A1

b) QT² = 18 x 8 = 144 M1

Qt = 12cm A1

1. (2-1)² + (5 – K)² = 10

1 – 25 – 10K + 1K² = 10

K² - 10K + 16 = 0

(K-2)(K – 8) = 0

K = 2 or 8

Centre (1,2) and (1,8)

1. A B

168 153 M1

165

12 3

4:1 A1

Alt: Method

168A + 153B = 165 M1

A + B

3A = 12B

A = 12 = 4

B 3 1

A:B 4:1 A1

1. Log 5x – 4 = Log 3 M1

x + 2

5x – 4 = 3 M1

x + 2

5x – 4 = 3x + 6

2x = 10

x = 5 A1

1. (a) 1 x 10

3.25 = 0.3077 x 10 = 3.077 B1

(b) 0.05 x 3.077 M1

= 0.1539 A1

1. Sin(3~~0~~ - 50⁰) = Cos (2~~0~~ + 10⁰)

3~~0~~ – 50 + 2~~0~~ + 10⁰ - 90⁰

5~~0~~ - 40⁰ = 90⁰

5~~0~~ = 130⁰

~~0~~ = 26⁰

1. 4.5L = 4.5 x 10³cm³

9m³ = 9 x 10cm³

v.s.f 4.5 x 10³ : 90 x 106

1 : 2000

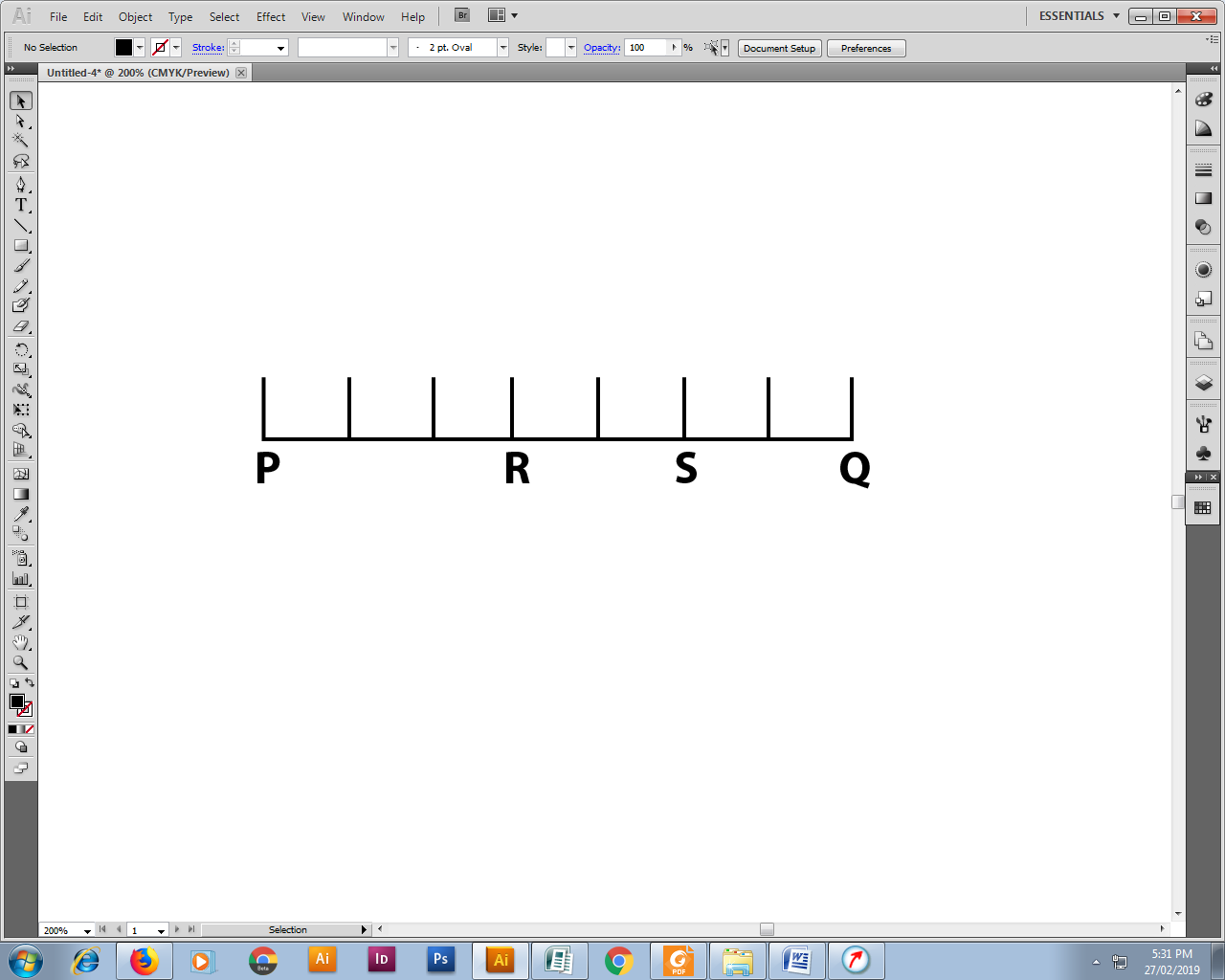
l.s.f 3√1 : 3√2000

1 : 12.6

90cm = x

h= 90 x 12.6

1134cm



PR: RQ = 3:4

PS : SR = 5: -2

PQ = 8CM

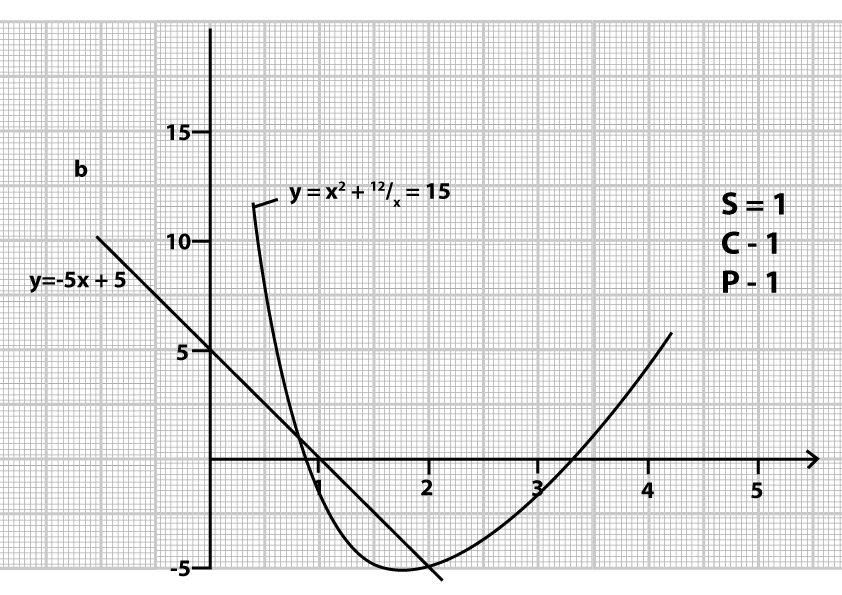
RS = 2/7 PQ

= 2/7 x 8

= 2.29cm

1. a)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X | 1 | 1.5 | 3 | 3.5 | 4 |
| Y | -2 | -4.75 | -2 | 0.6 | 4 |



1. 1.15 ≤ x ≤ 2.75 B2
2. y = 2² + 12/x – 15

y = x² + 12/x - 5x + 20 M1

y = -5x + 5

|  |  |  |
| --- | --- | --- |
| X | 0 | 1 |
| y | 5 | 0 |
|  |  |  |

M1

x = 2 or 0.8 A1

1. (a) 1st three terms are a, ar, ar² M1

Product a x ar x ar² = 64

a³r³ = 64 A1

r³ = 64/a³

r = 4/a

sum a + ar + ar² = 14

but R = 4/a

(a +a) 4/a) + a (4/a)2 = 14 M1

A + 4 + 16/q – 14

a² - 10a + 16 = 0

a² - 2a – 8a + 16 = 0 M2

a(a-2) – 8(a – 2) = 0 A1

a = 8 or a = 2

when a = 2, r = 2 when a = 8, r =½ B1

for a = 2 : Sequence 2, 4, 8, 16

For a = 8 : Sequence 8,4,2,1 A1

50thterm are ar49 and ar49 M1

2(2) 49 and 8(½) 49

Product 2(2)49 x 8(½)49 A1

= 16

1. a) (i) Taxable income 38892 + 2108 – Shs. 41,000 M1A1

(ii) 10164 x 10/100 = 1016.40

9576 x 15/100 = 1436.40 M1

9576 x 20/200 = 1915.21

9576 x 25/100 = 2394.00 M1

Rem 2108 x 30/100 = 632.40 M1

7394.40 M1

Less relief 1162.00

Kshs. 6232.40 A1

(b) Total deductions 41,000

15,000

Basic solar 26,000 M1

5/100 x 26000 = 1300 + payee

1300 + 6232.40 = 7532.40 M1

Net pay 41000 = 7532.40

Kshs 33,476.60 A1

10

1. Let A = 62

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Marks** | **f** | **x** | **D=x-A** | **fd** | **d²** | **fd²**  B1 d value  B1 fd²ratio  B1 - |
| 45-49 | 3 | 47 | -15 | -45 | 225 | 675 |
| 50-54 | 9 | 52 | -10 | -90 | 100 | 900 |
| 55-59 | 13 | 57 | -5 | -65 | 25 | 325 |
| 60-64 | 15 | 62 | 0 | 0 | 0 | 0 |
| 65-69 | 5 | 67 | 25 | 25 | 25 | 125 |
| 70-74 | 4 | 72 | 40 | 40 | 100 | 400 |
| 75-79 | 1 | 77 | 15 | 15 | 225 | 225 |
|  | F = 50 |  |  | Efd - 120 |  | =2650 |

1. Mean x = A + Efd

Ef

62 + -120 / 50 M1

= 62 – 2.4 = 59.6 A1

b) v = Efd² - Efd ² M1

Ef Ef

= 2560 - 120 ² = 53 – 5.76 M1A1

50 50

c) s.d= Efd² - Efd

Ef Ef M1

47.24

= 6.873 A1

10

B3

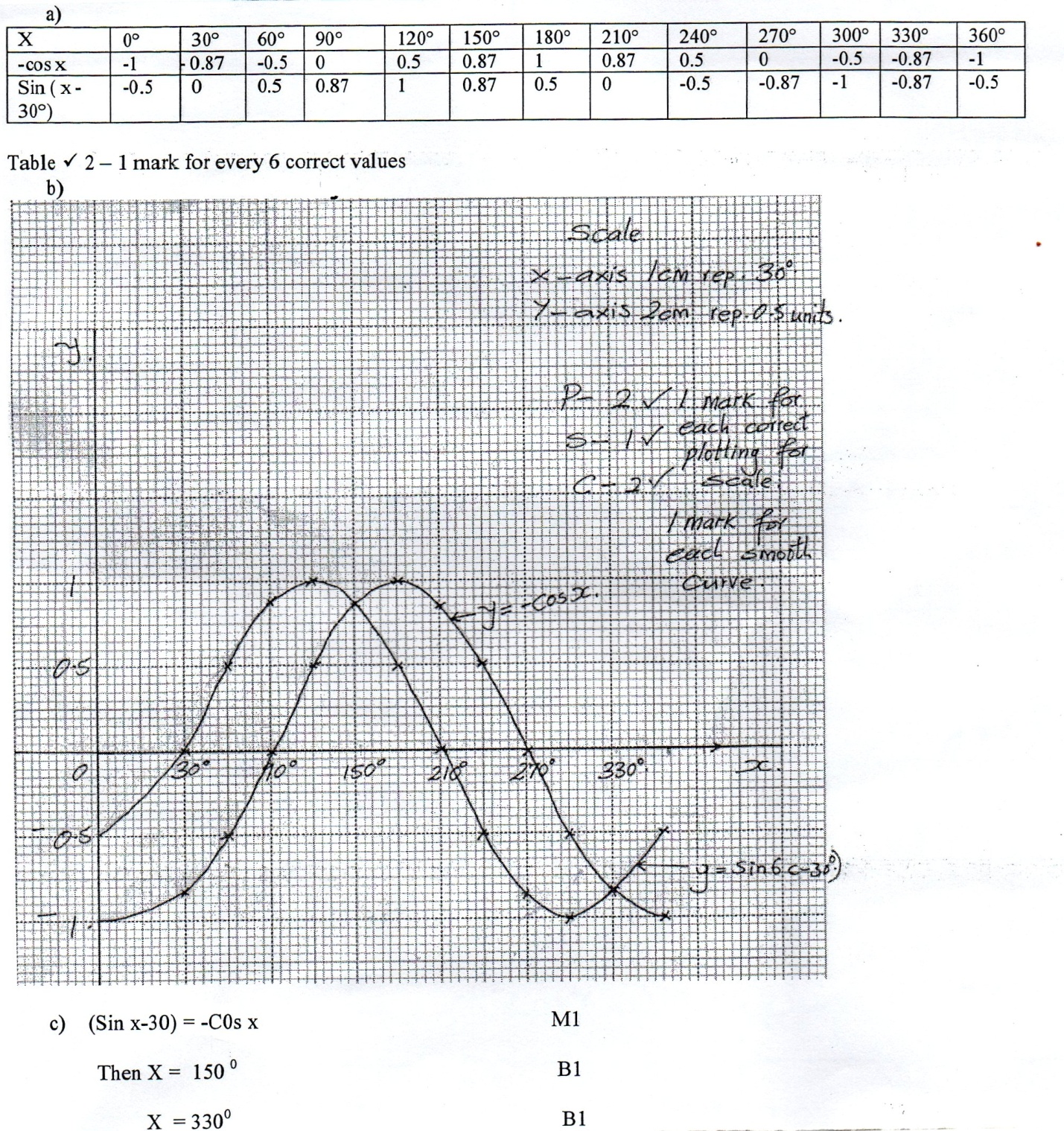
B

|  |  |
| --- | --- |
| 1 | 1 2 3 4 5  2 3 4 5 6 |
| 2  3  4  5  6 | 3 4 5 6 7  4 5 6 7 8  5 6 7 8 9  6 7 8 9 10  7 8 9 10 11 |

1. P = (x) = 1/6 M1
2. P(x and z) = p(x) x p(2) M1A1

1/6 x1/6 = 1/36

1. Event Y B1
2. Event Z B1
3. P(Y) = 5/36 M1A



1. <STQ = <PQS = 28⁰ B1

Angles in alternative segment. A1

1. <TQU = 180 – 54 = 63⁰ A1

2

Base angles of an isosleles triangle B1

1. <TQS = 63 – 28 = 35⁰ M1

<TUQ is alternative to <PQT = 63 B1

1. <UOQ = 54 x 2 = 108⁰

Angle subtended at the centre is twice that at the circumference by the same chord UQ B1

**.**·**.**Reflex**<**UOQ = 360 - 108⁰ A1

1. <TQR = <TSQ

= 180 – (28 + 35) = 117 B1

Angles in alternative segment are equal A1

1. C = n + 1/n

C = kn + c/n M1

135 = 2k + c/2- (i)

140 = 3k + c/3- (ii) M1

270 = 4k + c - - (i)

420 = 9k + c + (ii)

-150 = -5k

K = 30

270 = (4x30) + C M1

270 = 120 + C

C = 150 A1 correct value K & C

**.**·**.**C = 30n + 150/11 A1

b. C = (30 x 10) + 150/10 M1

= Shs. 315

c. 756 = 30n + 150/n

756n = 30n² + 150 M1

30n²= 756n + 150 = 0

15n² - 378n + 75 = 0 ac = 1125 -375 and -3 M1

15n² - 375n – 3n + 75 = 0 b = 378

15n(n – 25) -3 (n – 25)

(15n – 3) (n – 25) = 0

N = 25 A1

10