121/1

MATHEMATICS **LANJET CLUSTER JOINT EVALUATION – 2024**

PAPER 1 Kenya Certificate to Secondary Education

MAR/APR 2024 **MATHEMATICS PAPER 1- ALT A**

TIME: 2 ½ HOURS **TIME: 2 ½ HOURS**

**MARKING SCHEME**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | =  =  = x  = | M1  M1  A1 | For  For  for answer |
|  |  | 03 |  |
| 2. | 1  2  1  18  =  130  9  1  1  =  =  = 10 | M1  M1  A1 | Simplify up to perfect square |
|  |  | 03 |  |
| 3. | =  =  3(x + 7) = 6x  3x + 21 = 6x  x = 7 | M1  M1  A1 |  |
|  |  | 03 |  |
| 4. | 30 = 2 x 3 x 5  50 = 2 x 52  35 = 5 x 7  L.C.M = 2 x 3x 52 x 7  = 1050 mins  17 hrs 30 mins  Time = 7.18  +17.30  2448  ⇒ 12.48 a.m.  Tuesday | B1  M1  A1 | For addition  (Accept 0048h Tuesday) |
|  |  | 03 |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 5. | x + y = 10  (10y + x ) – (10x + y) = 54  9y - 9x = 54  y – x = 6  x + y = 10  -x + y = 6  2y = 16  y = 8  x = 2  Number is 28 | | | M1  M1  A1 | |  |
|  |  | | | 03 | |  |
| 6. | A  D  B  C  6cm  x  x  2x  x  2x  (2x)2 + x2 = 62  5x2 = 36  x = 2.683  Area = (x + 2x)(2x)  = (3 x 2.683) (2 x 2.683)  = 21.595467  ≈ 21.60 units | | | M1  A1  M1  A1 | | ✓ Expression for height  ✓ Expression for area  Accept |
|  |  | | | 04 | |  |
| 7. | Inter. ∠ = x  Exter. ∠ = y  x + y = 1800  x – y = 1080  2x = 288  x = 1440  ∴ext. ∠360  No. of sides =  = 10 sides | | | B1  M1  A1 | | For the inter. ∠and ext. ∠ |
|  |  | | | 03 | |  |
| 8. | Let the commission be x%  (500000 – 100000)  = 4000x  4000x + 10000 = 56000  x = 12.5% | | | M1  M1  A1 | | ✓Expression of interest |
|  |  | | | 03 | |  |
| 9. | Vol. cylinder ⇒  Vol. cone ⇒  =  h = x x 18 x  h = 1.5cm | | | M1  M1  A1 | | For ✓ vol. expression for the cylinder & cone  For equating to determine change in height |
|  |  | | | 03 | |  |
| 10. | -  -  - -  = - | | | M1  M1  A1 | | For ✓ factorization |
|  |  | | | 03 | |  |
| 11. | Present 4 yrs ago  Daugther ⇒ x x – 4  Mother ⇒ 2.5x 2.5x – 4  =  3x – 12 = 2.5x – 4  0.5x = 8  x = 16  Mother = 2.5 x 16  = 40 years | | | M1  A1  B1 | |  |
|  |  | | | 3 | |  |
| 12. | 5y + 2x – 7 = 0  y = -x +  Gr. Line = -  =  k – 5 = -2  k = 3 | | | B1  B1  A1 | |  |
|  |  | | | 03 | |  |
| 13. | 20000 x 147.86  = 2,957,200    = 5975.84 | | | M1  M1  A1 | |  |
|  |  | | | 03 | |  |
| 14. | C:\Users\Nzambia\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\maths.jpg(  a)  (c) Height = 3.7cm | | |  | | B1 ✓ Lines & angles drawn (allow ± 0.1cm)  B1 ✓ Labelling  B1 (Allow ± 0.1 cm) |
|  |  | | |  | | 3 |
| 15. | No. | Log |  | M1  M1  M1  A1 | ✓ 3 Logs  For addition and subtraction  For ✓ ÷ 3 | |
|  | 849.6  2.41 | 2.9292  0.3820+ |
| 3941 | 3.3112  3.5956- |
|  | 1.7156  ÷ 3 |
| 8.039 x 10-1 | 1.9052  = 0.8039 |
|  |  | | | 04 |  | |
| 16. | - 4.1512  ⇒ 2.737  4.1512 ⇒ 17.231  2.737 – 17.231  = -14.494 | | | B1  M1  A1 | For both | |
|  |  | | | 03 |  | |
| 17. | (a) Original members = x  Original each =  Later each =  - = 3000  - = 1  60x – 60x + 180 = x2 – 3x  x2 – 3x – 180 = 0  (x – 15) (x + 12) = 0  x = 15  (b)  = 12000  (c) Increase = 3000  x 100  = 25% | | | B1  B1  M1  M1  M1  A1  M1  A1  M1  A1 | ✓ Factorization | |
|  |  | | | 10 |  | |
| 18. | (a) r : R  = 1:3  (b) =  R = 21cm  (c)  21  7  15  30  Vol. Big cone = x x x 45  = 20790cm3  Vol. Small cone = x x x 15  = 770cm3  Vol. of frustrum = 20790 – 770  = 20020cm3  (d) Vol. tank = 150 x 120 x 180  Buckets =  = 71.93  ≅ 72 full buckets | | | B1  M1  A1  M1  M1  M1  M1  A1  B1 | Alternative method:  L.S.F = 1:3  V.S.F = 1:27  V.S.F frustum = 26  ∴ Vol. = 26 x 770  = 20020  For subtraction | |
|  |  | | | 10 |  | |
| 19. | (a) (i)  m/s  Secs  0  4  20  24  80  Distance = (16 + 24) x 80  = 1600m  (ii) -  = - 20m/s2  (b)  NRB  ELD  7.12  8.22  243km  8.22  105km  90km/h  72km/h  Relative distance = 348 –  = 243km  Relative speed = 162km/hr  Time taken = hrs  = 1.5 hrs  Time = 8.22 + 1hr 30 mins  = 9.52 a.m.  (c) 90 x 2km  = 240km | | | M1  A1  M1  A1  B1  M1  M1  A1  M1  A1 | Accept deccel. = = 20m/s2  For both R.D & R.S  OR 348 – (1.5 x 72)  = 240km | |
|  |  | | | 10 |  | |
| 20. | (a) (i) Modal class = 30 – 39   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Marks | x | f | fx | cf | | 20-29 | 24.5 | 3 | 73.5 | 3 | | 30-39 | 34.5 | 18 | 621 | 21 | | 40-49 | 44.5 | 13 | 578.5 | 34 | | 50-59 | 54.5 | 14 | 763 | 48 | | 60-69 | 64.5 | 17 | 1096.5 | 65 | | 70-79 | 74.5 | 12 | 894 | 77 | | 80-89 | 84.5 | 5 | 422.5 | 82 | |  |  |  | 4449 |  |   Mean =  = 54.2561  ≅ 54.26  (ii) Median = 49.5 + x 10  = 54.5  Diff = 54.5 – 54.26  = 0.24 | | | B1  B1  B1  M1  A1  B1  M1  A1 | = For ✓x column  For ✓ fx column  Correct to 2 d.p  For cumulative freq. | |
|  |  | | | 10 |  | |
| 21. | (a) A : B : C  25=: 30/= : 45/=  5 : 2 : 1  100% =  = 28.75/=  20% profit  = x 28.75  = 5.75/=  (b) A = 27.5/=  B = 33/=  C = 49.5/=  ∴ 100% =  = 31.625  % Profit = 1.15 x 31.625  = 36.36875  ≅ 36.50  (c) 45 – 36.50  = 8.50  % Profit = x 100  = 23.29% | | | M1  A1  M1  A1  M1  M1  A1  M1  M1  A1 | ✓ Expression for profit | |
|  |  | | | 10 |  | |
| 22. | (a) 5.92 = 7.82 + 6.62 – 2(7.8) (6.6) Cos P  Cos P =  P = 47.480  (b) = 2R  R =    = 4.002cm  (c) Area of Δ = x 7.8 x 6.6 Sin  = 18.97  Area of circle = 3.142 x 4.0022  = 50.32  Shaded area = 50.32  -18.97  31.35cm2 | | | M1  M1  A1  M1  M1  A1  M1  M1  M1  M1  A | For making Cos P subject  ✓ Expression for area of triangle  \* Follow through for other values  ✓ Expression for area of circle  For subtraction | | |

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| 23. | C:\Users\Nzambia\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\maths 2.jpg(a)  (b) Construction of any 2 ⊥ side bisectors  ✓Location of T  Distance RT = 5.2km  (c) Drop ⊥ from T to PQ  Distance = 1.5km  (d) S =  = 11km  A =  = 15.19868km2  ≅ 15.20km2 | B1  B1  B1  B1  B1  B1  B1  M1  A1 | For ✓ measurement with the given scale (1cm = 1km)  For ✓ triangle labelled.  Allow ± 0.1km  Allow ±0.1km  \* Allow any other alternative method by  calculate only. |
|  |  | 10 |  |
| 24. | (a) (i) ✓PQR drawn  ✓PIQI RI drawn  (ii) Reflection on the line y – axis (or x = 0)  (b) (i) PII(-3,-2)  QII(-2,-1)  RII(-1,-4)  ✓ ΔPIIQIIRII drawn  (ii) Negative quarter turn about (0,0) OR (2700) turn about (0,0) OR – 900 turn about (0,0)  (c) PIII(3,-2)  QIII(2,-1)  RIII(1,-4)  ✓ΔPIIIQIIIRIII drawn  (d) PQR and PIQIRI  PQR and PIIQIIRII  PIQIRI and and PIIIQIIIRIII  PIIQIIRII and PIIIQIIIRIII | B1  B1  B1  B1  B1  B1  B1  B1  B2 | Coordinates can be implied on the diagram  Coordinates can be implied on the diagram  - for 4 pairs  - Allow B1 for at least 2 pairs |
|  |  | 10 |  |

