**MATHEMATICS FORM 4 PP1 2022**

**MARKING SCHEME**

|  |  |  |
| --- | --- | --- |
| 1 |  | M1  M1  A1  03 |
| 2. | 3y = - – 3  y = – 1  GG2 = -1 G2 = 3  = 3  2 – a = -3 a = 5  = 3  y – 5 = 3 – 12  y = 3 - 7 | ✓M1  ✓B1  ✓M1  ✓M1 |
| 3. |  | B1  B1  B1 |
| 4. | xy = 24  x = ……………. i  (10y + x) – (10x + y) = 18  9y – 9x = 18  y – x = 2 ………….ii  substitute  y - = 2  y2 – 2y – 24 = 0  y2 – 6y + 4y – 24 = 0  y(y – 6) + 4(y – 6) = 0  (y + 4) (y – 6) = 0  y - 6 = 0 x = = 4  y = 6  The number is 46 | M1  M1  A1 |
| 5. | 1 Riyal buying = 19.68 shs  5480 = 107846.4  x 107846.4  = 71897.6  Remainder = 107846.4 – 71897.6  = 35948.8  Selling 1 Riyal = 19.74 shs  ? = 35948.8  = 1817.4 Riyal | M1  M1  A1 |
| 6. |  | B1  M1  A1  03 |
| 7. | a)Exterior angle=180-144=36    b)Sum of interior angles = 180(n-2)  =180(10-2)  =1440  Or 144\*10=1440 | B1  A1  02  A1  01 |
| 8. | a=0.45 b=1.5 | B1  M1  A1  03 |
| 9. | =0.59259 litres | M1  M1  A1  03 |
| 10. | 6x2 + kx – 2 = 0 x = 2/3  6(2/3)2 + k(2/3) -2 = 0  8/3 + 2/3k = 2  2/3k = -2/3  K = -1  6x2 – x – 2 = 0  (2x + 1) (3x – 2) = 0  2x + 1 = 0 x = - ½ | M1  A1  M1  A1 |
| 11. | Tap A in 1 minute ¼  Tap B in 1 minute 1/6  Retained ¼ - 1/6 = 1/12  In 2 min 1/12 x 2 = 1/6  Volume = 1/6 x 3000 = 500 litres | M1  M1  A1 |
| 12. | |  |  |  | | --- | --- | --- | |  | Present | 3 yrs time | | Jim | 12 | 15 years | | Father | 15 x 3 = 45 |  |   Father 45 – 12 = 33 years | M1  A1 |
| 13. | 4x – 3 < ½ ( x + 8)  4x – ½ x < 4 + 3  3 ½ x < 7  x < 2  ½ x + 4 < x + 5  -1 < ½ x  -2 < x  -2 < x < 2  │ │ │ │  -2 -1 0 1 2 | M1  M1  B1 |
| 14. | 1. = -2         4 + y = -10  6    =  = 6.325 units | B1  B1  M1  A1 |
| 15. | +  0.2901 x 0.1 + 9.233 x 0.1 + 814.8 x 0.001  0.02901 + 0.9233 + 0.8148  = 1.76711 |  |
| 16. | dy = 6x – 4  dx  At x = 2, gradient of tangent  dy = 6(2) – 4  = 8  Gradient of normal = - 1/8  Equation of normal is y – 5 = - 1/8  x – 2  8(y – 5) = - 1 (x – 2)  8y – 40 = - x + 2  8y = - x + 42  x + 8y = 42  y= -1x + 21  8 4 | B1  M1  A1  03 |
| 17. |  |  |
|  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | Class | x | f | fx | c.f | | 5-9 | 7 | 20 | 140 | 20 | | 10-19 | 14.5 | 50 | 725 | 70 | | 20-39 | 29.5 | 40 | 780 | 110 | | 40-49 | 44.5 | 30 | 1335 | 140 | |  |  | ∑f=140 | ∑fx=2980 |  | | B1  B1  B1  B1  B1 |
|  |  | B1  B1  B1  B1 |
| 18. |  | B1  M1  B1  A1  B1B1  A1  B1  B1  B1  B1  10 |
| 19. | a) V= 2t2 – 10t + 12  2t2 – 10t + 12 = 0  2 2 2  t2 – 5t + 6 = 0  t=3 or t = 2  b) ds = 2t2 – 10t + 12  dt  S=  = 2/3t3 – st2 + 12t  = 2/3(3)3 – 5(3)2 + 12(3)  18 – 45 + 36  = 9m   1. At max velocity,a =0   a==4t-10  4t-10=0  s=2.5s  v =2x2.52-10x2.5+12=-0.5m/s | M1  A1  M1  A1  M1  M1  A1 |
| 20. | C:\Documents and Settings\Mulaki\Local Settings\Temporary Internet Files\Content.Word\Picture 229.jpg | S1 - Scale  B1 - for ✓ΔABC drawn  B1 - for ✓co-ordinate of A1B1C1  B1- for✓ centre used  B1- for ΔA11B11C11  drawn  B1 - for co-ordinate of A11B11C11  B1 - for ✓Δ A111B111C111  B1 - for ✓coordinate A111B111C111  B2 - for ✓………allow B1 if not fully described  10 |
| 21. | a) ACxAB=ADxAF  80x30=40xAF  AF=60cm  DF=60-40=20cm  b) OE bisects DF  EF=10cm  OE==60.17cm  c) Sin o=0.1639  Angle O=9.44   1. Angle DOF=9.44x2=18.88   Reflex angle=360-18.88=341.12  L=x61=363.32 cm |  |
| 22. | 1. True bearing of charo’s from father’s 2. Compass bearing of fathers from Ben’s 3. Distance Ben’s and fathers   7.5 x 10 = 75km   1. Distance (total) by charo   2(100 + 75 + 80) = 510KM | M1  A1  M1  A1 |
| 23. | |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | x | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | | y | -11 | -3 | 3 | 7 | 9 | 9 | 7 | 3 | -3 | -11 |   24   1. X= -1.6,4.4 2. y = 7 + 3x – x2   0 = -3 – 4x + x2+  y = 4 - x     |  |  |  | | --- | --- | --- | | x | 0 | 2 | | y | 4 | 2 |   d)   |  |  | | --- | --- | | x | 1.5 | | y | 9.2 |   Turning point  (1.5, 9.2) |  |
| 24. | (i) (4000 x 12) +(1100 x 12)  = Sh. 61,200  (ii) 1st slab 4200 x 8400 19800  2nd slab 3800 x 3 = 11400  3rd slab 4600 x 5 = 23000 42800  4th slab x 6 = (61,200 – 42800)  = K₤ 3066.70  = Taxable income  (12600 + 3066.70  = K₤ 15666.7  (iii) - 10800  = KSh. 15,311.20  (iv) 26111.20 – 4000  Sh. 22,311.20 | M1  A1 or 5100 x 2  M1  M1  M1  A1  M1  A2  M1  A1 |
|  |  |  |