SUNRISE MATHEMATICS P2 MARKING SCHEME 2021

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|  | (√2 +√3) (√6 + √3)  (√6 - √3) (√6 + √3)  √12 + √6 + √18 + 3  6 – 3  2√3 + √6 + 3√2 + 3  3 | M1  M1  A1 |
|  | 3(2x-1) = 8x-1  6x-3 = 8x-1  -2x = 2  x = -1 | M1  A1 |
|  | A = P 1 + r n    100  = 200,000 1 + 7 4    100  = 200,000 (1.3107960)  = Sh. 262159.20  I = 262159.20 – 200000 = Sh.62,159 | M1  A1  B1 |
|  |  |  |
|  | 12th term = ar11  10th term = ar9  ar11 = 9  ar9 1  r 11-9 = 9  r2 = 9  r = + 3  r = 3 or -3 | M1  A1 |
| 1. 7.   ii. | (2 – ¼ x)5 = 25 + (24)(5)(-1/4x)2 +  10(22)(-1/4x)3+ 5(2)(-1/4x)4 + (-1/4x)5  =32 – 20x + 5x2 – 5/8x3 + 5/128x4 – 1/1024 x5  1.965 = 32 - 20(0.16) + 5(0.16)2 – 5/8 (0.16)3 +5/128(0.16)4 – 1/1024(0.16)5  =28.925 | B1  M1  A1 |
|  | a) QW x QX = QY x QZ  11 x 6 = 4(a+4)  4a +16 = 66  4a = 50  a = 25  b) QS2 = QY x QZ  = 4(4+12.5)  QS = √66  = 8.124 | M1  A1  M1  A1 |
|  | x(x-1) – 3x(x+1) = 0  x2 – x – 3x2 – 3x = 0  -2x2 -4x = 0  -2x (x + 2) = 0  x = 0 or x = -2 | M1  M1  A1 |
|  | x f cf  45 – 50 2 2  51 – 56 10 12  57 – 62 11 23  63 – 68 20 33  69 – 74 6 39  75 – 80 1 40  ¼ x 50 =12.5th = 56.5 + 12.5 – 12 6  11  = 56.77kg  ¾ x 50 = 37th ;    62.5 + 37.5 – 23 6  20  = 66.85kg  Quartile deviation = ½ (66.85 – 56.77)    = 5.04 | B1  B1  A1 |
|  | P = KQ3  √R  P1 = K (1.2Q)3  √0.64R  = 1.728KQ3  0.8√R  = 2.16 KQ3  √3    2.16 – 1 x 100  1  = 116% | M1  M1  A1 |
|  | Let cos x be y  8y2 – 2y – 1 = 0  4y + 1) (2y – 1) = 0  y = - ¼ or ½  cos x = ¼ => x = 75.52  angle in 2nd and 3rd quadrant  . : . x = 104.48, 255.52  Cosx = ½ => x = 600  Angle in 1st and 4th quadrant.  x = 600, 3000  .:. x = 104.48, 255.520, 600 3000 | M1  A1  B1 |
|  | A² (5 - 4χ) = 3 + 2χ  5A² - 4A²χ = 3 + 2χ  5A² - 3 = 2χ + 4A²χ  5A² - 3 = χ(2 + 4A²) |  |
|  | /AB/=  =  /AB/=4.90 | M1  M1  A1 |
|  | x2-6x+9+y2-10y+25= -30+9+25  (x-3)2+(y-5)2=4  R=2  C (3,5) | **B1**  **B1**  **B1** |
|  | 3x+y=17  2x+4y=10  X=5.8  Y=-0.4  (-0.4,5.8) |  |
|  |  | M1  M1  A1 |
|  |  | B1  M1  A1 |
|  |  |  |
| 1. 19. | a) Taxable income = 21,000 + 9000  p.a = sh. 30,000  30000 x 12 = K₤ 18,000 p.a  12  2 x 3900 = 7,800  3 x 3900 = 11,700  4 x 3900 = 15,600  5 x 3900 = 19,500  7 x 2400 = 16,800  71,400  15/100 x 2000 = 300  Total relief p.a = (300 + 1056) 12  = sh. 16,272  Tax paid 71400 – 16272 = sh. 55, 128  P.A.Y.E 55128 = sh 4594  12  b) Total deductions = 4594 +2000 + 2000 + 2500 = sh. 11,094  per month  Net salary = 30,000 – 11,094    = sh. 18,906 | B1  B1  B1  B1  B1  B1  B1  M1  M1  A1 |
|  | i) 7/200 x 50 + 19/400 x 30  1.75 + 1.425  = 3.175  ii) 3.175 x 100  80  = 3.96875%  iii) let the masses be x  19/400 x + 7/200 (50 – x) 100 = 4  50  1.25 x + 1.75 100 = 4  50  1.25 x + 175 = 200  1.25x = 25    x = 25  1.25  x = 20  x > 20 | M1  M1  A1  M1  A1  M1  M1  M1  A1  B1 |
| 1. 21. | W  5/10  6/11 W B  7/12 W 5/10  W  5/11 B 6/10  4/10 B  5/12  7/11 W 6/10  B W  4/11 B 4/10  7/10 B  3/10 W  B  b) i) (7/12 x 6/11 x 5/10) + (7/12 x 5/11 x 6/10) + (5/12 x 7/11 x 6/10)  = **21/44**  ii) (7/12 x 5/11 x 4/10) + (5/12 x 7/11 x 4/10) + (5/12 x 4/11 x 7/10)  = **7/22**  iii) (5/12 x 4/11 x 7/10) + (5/12  x 7/11 x 4/10) + (7/12 x 5/11 x 4/10) + (5/12  x 7/11  x 6/10) + (7/12 x 5/10 x 6/10) + (7/12 x 6/11 x 5/10) + (7/12 x 6/11 x 5/10)  = **427/440** | M1  A1  M1  A1  M1  A1 |
|  |  | T2  P1  C1  P1  C1  B1  **B1**  **B1**  **B1** |
|  |  |  |
|  | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Class | Mid point X | f | t = | ft | t2 | ft2 | cf | | 15-19 | 17 | 6 | -5 | -30 | 25 | 150 | 6 | | 20-24 | 22 | 10 | -4 | -40 | 16 | 160 | 16 | | 25-29 | 27 | 9 | -3 | -27 | 9 | 81 | 25 | | 30-34 | 32 | 5 | -2 | -10 | 4 | 20 | 30 | | 35-39 | 37 | 7 | -1 | -7 | 1 | 7 | 37 | | 40-44 | 42 | 11 | 0 | 0 | 0 | 0 | 48 | | 45-49 | 47 | 15 | 1 | 15 | 1 | 15 | 63 | | 50-54 | 52 | 13 | 2 | 26 | 4 | 52 | 76 | | 55-59 | 57 | 8 | 3 | 24 | 9 | 72 | 84 | | 60-64 | 62 | 7 | 4 | 28 | 16 | 112 | 91 | | 65-69 | 67 | 5 | 5 | 25 | 25 | 125 | 96 | | 70-74 | 74 | 4 | 6 | 24 | 36 | 144 | 100 | |  |  |  | f = 100 | ft = 28 |  | ft2 = 873 |  | |  |
|  | a) (i) x = 42 + = 43.4  (ii) - = 0.7856  (b) x  = 12.31 |  |
|  |  |  |
| 1. 23 | + =  A+4b = 7 ……….(i) x 4  4a + 16b ………..10 (ii)  4a + 16b = 28    b = 1  a = 9-4 = 3  c+4d =4 ………. (iii) x 4  4c – 2d = 16 ………..(iv)  4c + 16d = 16    d =0  c =4  =  ii.  **= =**  **B1 (-6 ,-8)**  b) **A1 B1 C1 A11 B11 C11**  **=**  **A11 (10,7) B11 ( -4,-6) C11 (4,10)**    **=** | M1  M1  M1  A1  M1  A1  M1  A1  M1A1 |
|  |  | 10 |
| 1. 17 | a)  Required angle is θ  82=102+122-2x10x12cosθ  64=244-240 cosθ  -180= -240 cosθ  cosθ =180  240  θ= cos -1180 = 41.41°  240  b) Space =volume  = ½ x 6 x10sin 41.41°x24  = 60sin41.41°x24  =952.5m3  C)  B  TA= 10 sinθ= 10xsin41.41°  Tan∝=10xsin41.41  24  tan∝=0.2756  = 15.41° | M1  M1  A1  M1  M1  A1  M1  M1  M1  A1 |