**121/2**

**MATHS**

**PAPER 2**

**MARKING SCHEME .**

|  |  |  |  |
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| **1.** | **(**x- y) ( x+y)  ( 3282 – 3272) ( 3282 + 3272)  65540 | **M1**  **M1**  **A1** |  |
|  |  | **3** |  |
| **2.** | Tan x = is positive 3rd quadrant  Then sin x = -3  5  Hypotense    3  h  4  h = √ 42 + 32 = √ 25 = 5  Sin x = -3  5  Cos x – sin x = -4 - -3 = -3  5 5 5  = -1  5 | **B1**  **M1**  **A1** | **Identification the hypotenuse**  **Cao**  **accept (-0.2)** |
|  |  | **3** |  |
| **3.** | 16 + 6(- ½ x ) + 15(- ½ x )2 + 20(- ½ x )3  = 1 – 3x + 15x2  - 5 x3  4  X = -0.04  1-3 ( -0.04) + 15 (-0.04)25 ( -0.04) 3  4 4  = 1 + 0.12 + 0.006 + 0.000616  = 1.12616  = 1.1262 | **M1**  **M1**  **M1**  **A1** | **For✓ simplification**  **For✓ substitution of x** |
|  |  | **4** |  |
| **4.** | a + ar3 = 140  2  64 + 64 r3 = 140  2  64 + 64 r3  = 280 64 r3  = 280 – 64  64 r3  = 216 r = √216  64  r = 3  2 | **M1**  **M1**  **A1** |  |
|  |  | **3** |  |

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| **5.** | a2 = b2d2  b2 –d  a2b2 - a2d = b2d2  a2b2  - b2d2  = a2d  b2(a2 - d2) = a2d  b2 = a2 d  a2 - d2  = a2 d  a2 d2 | **M1**  **M1**  **A1** | **✓ sq on both sides**  **CAO** |
|  |  | **3** |  |
| **6** | P = aQ + √ Q  P = 16a + 4b  ( 500 = 16a + 4b)  (800 = 25a + 5b)  2500 = 80a + 20b  3200 = 100a + 20b  -700 = -20a  35 = a  Then b = -15  Equation connecting P and Q  p = 35Q – 15 √Q | **M1**  **M1**  **M1**  **A1** | **For ✓ equation**  **For ✓ formation of simultaneous equations**  **For ✓ values of both a and b** |
|  |  | **4** |  |
| **7.** |  | **M1**  **A1** |  |
|  |  | **2** |  |
| **8** | 4.562 x 0.38 = 1.73356  4 √1.73356 = 1.14745 ÷0.82    = 1.3993  = 1.4 | **M1**  **M1**  **A1** |  |
|  |  | **3** |  |
| **9.** | 18 x 64 x 5  24 x 80  6 x 64  8x 16  3 days | **M1**  **M1**  **A1** | **For✓ simplification** |
|  |  | **3** |  |
| **10.** | True value = √1 + n = 1.44 = 1.2  Approx. value  1 + n = 1 + 44 = 1.22  2 2  = 1.22 – 1.2  = 0.02   * 1. x 100 =   1.2  = 1.67 % | **M1**  **M1**  **A1** |  |
|  |  | **3** |  |
| **11.** | 3 0 a b = 3 + a b  0 4 0 c 0 4 + c  3a + 0 = 3 + a  3b + 0 = b  3a = 3 + a a = 3  2  3b + 0 = b  2b = 0  B = 0  0 + 4c = 4 + c  3c = 4  C= 4  3 | **M1**  **M1**  **A1** | **For matrix equation**  **For✓ forming of simultaneous equation**  **For values of a, b and c ( correct)** |
| **12.** | 2x2 – 2x + x -1  ( x + 1 ( x – 1)  2x ( x – 1 ) + 1 ( x- 1)  ( x + 1 ) (n- 1 )  = ( 2x + 1)  ( x + 1 )    = 2x + 1  x + 1 | **M1**  **M1**  **A1** |  |
|  |  | **3** |  |
| **13** | 1. cm = 25000cm 2. 1cm = 250m 3. 1cm = 0.25   1cm2 = 0.0625  20cm2  = 20 x 0.0625  = 1.25/ cm2 | **M1**  **M1**  **A1** |  |
|  |  | **3** |  |
| **14.** | AB . BC = DC -2  5: BC = 36  BC = 36  5    = 7.2 cm | **M1**  **M1**  **A1** |  |
|  |  | **3** |  |
| **15.** | Log108 + Log10750  - Log106  Log10 Log10( 8 x 750)  6  = Log101000  = 3 | **M1**  **M1**  **A1** |  |
|  |  | **3** |  |
| **16.** | P (R )= ½ x 4  12  P (R )= ½ x 3  18  = 1 + 3   1. 20   = 20 + 18  120  = 38 19   1. = 60 | **M1**  **M1**  **M1**  **A1** |  |
|  |  | **4** |  |

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| **17** | Taxable income 115 x 8570 = 9855.50  100  9855.50x 12 p.a  20  5913.30  **Tax**  1 – 1500 150  1501 – 3000 225  3001 – 4500 375  4501 – 5913.30 494.30  1244.30 -  90.00  K £ 1154.30 pa . or  Ksh 1923.83 per month  Total Decuctions  2 x 9855.5  100  197.11 ( wcps)  +  20.00  246.00  +  Tax per month 1923.83  2386.94  Net salary  9855.50 – 2386.94  Ksh 7468.65 | **M1**  **A1**  **M1**  **M1**  **M1**  **A1**  **M1**  **A1**  **M1**  **A1** |  |
|  |  | **10** |  |
| **18.** | i) θ ( 2πR cos θ)  360  = 60 x 2 x 22 x 6370 cos 60  360 7  = 1/3 x 22 x 910 x 0.5  = 3336 7  ii) Time ( 4 x 60) hrs  60  4 hrs.  Local time 1200 + 4  = 1600hrs  b) θ x 2πR = 800  360  = θ x 2 x πx 6370 = 800  360   * = 800 x 360   2 x π x 6370  = 7.196°  ∠ (60 – 7.196) = 52.80°  ( 52.8° N 45°E) | **M1**  **A1**  **B1**  **M1**  **M1**  **A1**  **B1** |  |
| **19** |  | **10** |  |
|  |  |  |  |
|  |  | **10** |  |

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| **20.** | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | X | 30 | 60 | 120 | 180 | 240 | 270 | | Sin x | 0.5 | 0.87 | 0.87 | 0 | -0.87 | -1.0 | | 2 cos x | 1.73 | 1.0 | -1.0 | -2 | -1.0 | 0 | |  |  |  |  |  |  |  | | Y | 2.23 | 1.87 | -0.13 | -2 | -1.87 | -1.0 |   mso56BC9  c) x = 114 ± 3° and  x = 294 ± 3°  line thro y = -1.5  d) | **B2**  **S1**  **P1**  **C1**  **B2**  **L1**  **B2** | **For all 6 values of y✓**  **B1 for at least 4 ✓**  **Appropriate scale use**  **✓ plotting**  **✓ curve**  **Points identified and stated**  **B1 only stated**  **✓ line**  **Points identified and stated**  **B1 only stated** |
|  |  | **10** |  |
| **21** | R  2/11  5/11 W  4/11 B  R  R 3/11  3/12 4/11  W  5/12  w    4/11 B  4/12 B  R  3/11  5/11 W  3/11 B | **B2** | **🗸 🗸 prob, tree** |
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|  | a) P ( RR) = 3/12 x 2/11  1/22  b) P(IR) = RW or RB or WR or BR  15/132  + 12/132 + 15/132 + 12/132  9/22   1. p( At least white Ball ) =   P(RW) + P(WR) + P(WW) + P ( WB) + P(B)  15/132 + 9/132 + 20/132 + 20/132 + 20/132  = 84/132 or 7/11     1. P(RR or WW or BB)   = 6/ 132 + 20/132 + 12/132  = 19/66 | **M1**  **A1**  **M1**  **A1**  **M1**  **A1**  **M1**  **A1** | **Or equivalent 0.04545**  **Or equivalent 0.4091**  **Or equivalent 0.6364**  **Or equivalent 0.2424** |

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| **22** | |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | X | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | | Y | 0 | 6 | 10 | 12 | 12 | 10 | 6 | 0 |   msoD4847  ½ ( 6 + 10 ) + ½ ( 12 + 12) + ½ ( 12 + 10 ) + ½ ( 10 + 6)  = 8 + 11 + 12 + 11 + 8 = 50cm2  u  -x2 + 3x + 10 = - 64 + 24 + 10 - 1/3 + 3/2x –10 = 511/5cm  3  = -1  = % error 511/2 – 50  = 1 ½ x 100 = 2 %  511/2 | **B2**  **S1**  **P1**  **C1**  **M1**  **A1**  **M1**  **M1**  **M1**  **A1** | **8 values ✓**  **B1 at least 6✓**  **Appropriate scale use**  **✓ plotting**  **✓ curve** |
|  |  | **10** |  |

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| **23.** | a) i) AC2 = 82 + 62 = 100  AC = 10cm  ii) AF2  = 102 + 52 = 125  AF = 11.18cm  b) Tan x = 5/11 = 0.5  x = 26.52**°**   1. Tan x = 5/6 = 0.8333   x = 39.7° | **M1**  **A1**  **M1**  **A1**  **B1**  **M1**  **A1**  **B1**  **M1**  **A1** | **Sketch**  **Sketch** |
|  |  | **10** |  |

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| **24** | mso48F15 | Inequalities  x ≥O  y ≤O  4x + 3y ≤ 36  4x + 3y = 24  y = n  For ✓ shading of x ≥o and y≥ o  2x + 3y ≤ 36  y ≤ n  P profit function object we function P = 4x + 3y  Max profit at point (6,4)  P = 4(6) + 4,88)(4)  = 56  Hence he should here 6 medium of type A and 4 machine of type B | **B1**  **B1**  **B1**  **B1**  **B1**  ✓  shading  and line  **B1**  shading  and line  drawn  **B1-for** ✓  shading  and line  drawn  **B1**  **B1**  **B1** |
|  |  |  | **10** |