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| **NO.** | **WORKING** | **MARKS** | **REMARKS** |
|  | 900p+700q=820p+820q  80p=120q **NB: accept Pearson’s square method**  p:q = 3:2 | M1  M1  A1 | Attempt to find buying price of the mixture  Accurate ratio |
| 03 |
|  | =  = | B1  B1  M1  A1 | Expansion of first function  Expansion of 2nd function  Addition of the two functions  C.A.O |
| 03 |
|  | A = P  30 000 = P  P =  = 23 627  Cash price = (23 627 + 5000)  = 28 627  Carrying charge = 35 000 - 28 627  = 6373  = 6400 | B1  M1  A1  B1 | Attempt to find 30 000  Substitution  Accurate value of P  The carrying charge to the nearest hundreds. |
| 04 |
|  | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | X | 3 | 5 | 7 | 9 | 11 |  | | d= | -4 | -2 | 0 | 2 | 4 |  | |  | 4 | 2 | 0 | 2 | 4 | 12 |   Mean absolute deviation =  = 2.40 | M1  M1  A1 | Attempt to calculate mean  Attempt to work out M.A.D  C.A.O |
| 03 |
|  | 40x + 100y = P  4x + 10y = P  Point of intersection are (16, 16)  40(16) +100(16)=2240  Maximum profit = Ksh. 2240 | B1  B1  B1 | Objective function correctly written  Reading of the values from the graph  Accurate maximum |
| 03 |
|  |  | M1  M1  A1 | Square both sides to get rid of  Attempt to perform simplification  Accuracy |
| 03 |
|  | = 65-2(2)  = 61 m/s | M1  A1 | Differentiation  Accurate velocity. Assume if sign not indicated otherwise wrong unit penalize fully  Accurate time |
|  |
| 1. 65 – 2t = 0   t =  seconds or 32.5 seconds | B1 |
| 03 |  |
|  | AX,XC = DX.XB    XC = 4 cm  BT =  = 12 cm |  | XC correctly found  Relationship of external intersection of lines  Accuracy |
| B1  M1  A1 |
| 03 |
|  | ASF =    x = 1 or -1 | M1  M1  A1 | Attempt to get A.S.F  Attempt to solve quadratic function  The two roots given |
| 03 |
|  | y =  or | M1  M1  A1 | Dropping of logs.  Attempt to solve quadratic function. The other techniques correctly applied. |
| 03 |
|  |  | B1  B1 | Construction of angle 60 at Q and O.  Required tangent. |
| 02 |
|  | P(BBG) or P(BGB) or P(GBB)    =  =  reject 0.4773 | M1  M1  A1 | The denominator decreasing by 1  Substitution  Accuracy |
| 03 |
|  | = 30 or 150 | M1  M1  A1  B1 | Quadratic function.  Attempt to solve  The two  All the angles given. |
| 04 |
|  | C  C (2,2)  r =  =  or 2 | B1  M1  A1 | Centre and radius given.  Expression of eqn of a circle  Accuracy in the required format |
| 03 |
|  | ar = 16  ar = 2 | M1  A1  B1 | Connecting the two terms  Value of r  Value of a correctly computed. |
| 03 |
|  | =  = 2.000 | B1  M1  A1 | Drawing the tangent line.  Calculation  Accurate tangent must be to 4 s.f |
| 03 |
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|  | 1. PR =   = 10 cm  Height =  = 12 cm | M1  A1 | Attempt to find PR  Accuracy (h)  Cosine rule  Sine rule  Accuracy |
| 02 |
| SJ =  = 9.605    = 28.72 | M1  M1  A1 |
| 03 |  |
| 1. tan x =   x = 71.57 | M1  A1 | Use of SOHCAHTOA  Accuracy.  Cosine rule applied.  Sine rule applied  Accuracy |
| 02 |
| x= 8.4849 | M1  M1  A1 |
| 03 |  |
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|  | (10.5=6.25k+0.4m)0.25  (30.75=16k+0.25m)0.4      k = 2  12.3 = 12.8 +0.1m  m = -5 | M1  M1  A1  B1 | Attempt to come up with simultaneous eqn.  Attempt to solve simultaneous eqn.  Accurate value of k  Equation connecting the variables. |
| 04 | Substitution  Accuracy, accept decimal point to 4s.f |
| 1. P = 2(1.5) -   = | M1  A1 |
| 02 | Substitution  Accuracy.  Substitution  Accuracy. |
| 1. i) | M1  A1 |
| 02 |
| ii)  = | M1  A1 |
| 02 |  |
|  | 10 |

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|  |  | **B1** line AB correctly measured  **B1** angle 75 correctly constructed.  **B1** triangle ABC completed.  **B1** Determination of height as 3 cm  **B1** location of locus P  **B1**  30 at B and A constructed.  **B1** locus of Q drawn(major arc)  **B1** drawing an arc 5 cm with discontinuous curve.  **B1** angle bisector of ACB  **B1** – region R correctly shaded. |
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|  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Weight | F | X | d= x – A | Fd | Cf | | 1 -10  11 – 20  21 – 30  31 – 40  41 – 50  51 – 60  61 – 70  71 – 80  81 – 90  91 - 100 | 2  10  13  17  18  14  10  6  6  4 | 5.5  15.5  25.5  35.5  45.5  55.5  65.5  75.5  85.5  95.5 | -36.5  -26.5  -16.5  -6.5  3.5  13.5  23.5  33.5  43.5  53.5 | -73  -265  -214.5  -110.5  63  189  230  201  261  214 | 2  12  25  42  60  74  84  90  96  100 | |  |   = 46.95 | B1  M1  A1 | For fd  Attempt to find mean using assumed mean.  Accuracy.  Attempt to substitute in the formulae of median.  Accurate median.  Attempt to compute upper quartile  Accuracy.  Range stated correctly.  Substitution.  Accuracy. |
| 03 |
| 1. Median =   = 44.94    = 61.5  Range = 44.94 – 61.5 | M1  A1  M1  A1  B1 |
| 05 |
| 1. 80th percentile =   = 66.5 tonnes | M1  A1 |
| 02 |
|  | 10 |

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|  | 1. i)   = 7237.75  ii)   1. 40 478 – 5480   = 34 998 | M1  A1  M1  M1  M1  M1  M1  A1  M1  A1 | Finding gross tax  Accuracy  1st two slabs  Next two bands  Computation of last band  Attempt to find p  Division  Accuracy  Subtraction of allowance  Accuracy. |
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|  | 1. D =   =  = 3 600 nm   1. Let  in longitude be     = 90  X(60N,105E)   1. Time taken between   PQ =  QX =  Total time = 15 hours  1330+1500= 2830  2830 – 2400 = 4.30 am or 0430hr      = 1718.18 nm | M1  A1  M1  A1  B1  B1  M1  A1  M1  A1 | Application of getting great circle  Accuracy.  Substitution  Accurate  Location stated correctly.  Total time.  Addition  Time unit must be written  Attempt to find r  Accuracy in nm |
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|  | |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **0** | **15** | **30** | **45** | **60** | **75** | **90** | **105** | **120** | **135** | **150** | **165** | **180** | | **0.00** | **0.50** | 0.87 | **1.00** | 0.87 | **0.50** | **0.00** | -0.50 | **-0.87** | -1.00 | -0.87 | **-0.50** | **0.00** | | **0.87** | 0.97 | **1.00** | 0.97 | **0.87** | 0.71 | 0.50 | **0.26** | 0.00 | **-0.26** | **-0.50** | -0.71 | -0.87 |      1. x= 40 , 60and 160 | B2 all entries correct  B1 8 to 11 entries correct  B0 otherwise  P1 first curve  C1 curve 1 smooth  P1 2nd curve  C1 2nd curve smooth  B2 all correct  B1 two correct  B0 otherwise  **B1** for first inequality  **B1** the other inequality |
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|  | 1. i) **XB =**   ii) **ZA =**   1. i) **OM = OZ** + **ZM**   **=**  **=**  **OM**= **OX**  + **XM**  **=**  **=**  **=**  21 – 15k=18m  10k=6-3m  18m+15k=21  3m+10k=6  18m+15k=21  18m+60k=36  -45k=-15  k=  m =  ii) **OM=**  =  iii) 3 : -2 | B1  B1  M1  M1  M1  M1  A1  M1  A1  B1 | Correct vector  Vector correct  Attempt to express in terms of k  Attempt to express in terms of m  Connecting the eqns.  Attempt to solve simultaneous eqn  Values of k and m  Substitution  Accuracy  Correct ratio. |
| 10 |