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| **JJEB HD Logo B&W - 2019** | **JINJA JOINT EXAMINATIONS BOARD**  **MOCK EXAMINATIONS 2019**  **Uganda Advanced Certificate of Education**  **Marking Guide for Mathematics**  **456/1 2019** |

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|  | **SOLUTIONS** | **MARK** | **COMMENT** |
| **Q.1** | *(x + 2y)2 – (2y – x)2*  *x2 + 4xy + 4y2 – (4y2 – 4xy + x2)*  *x2 + 4xy + 4y2 – 4y2 + 4xy – x2*  ***= 8xy*** | M1M1  M1  A1 | M1 for*x2 + 4xy + 4y2*  M1 *4y2 – 4xy + x2* |
|  |  | **04** |  |
| **Q.2** | ***=***  *(x + 3)(x – 2) = 24*  *x2 + x – 6 = 24*  *x2 + x – 30 = 0*  *x2 + 6x – 5x – 30 = 0*  *x(x + 6) – 5(x + 6) = 0*  *(x + 6)(x – 5) = 0*  *Either x + 6 = 0 Or x – 5 = 0*  ***x = - 6 Or x = 5*** | M1  M1  M1  A1 | M1 for expansion  For forming quadratic equation  For both values |
|  |  | **04** |  |
| **Q.3** |  | B1  B1  B2 | Label horizontal as marks  Label vertical as No of candidates or frequency  All 8 bars correct  B1 5 – 7 bars correct \* |
|  |  | **04** |  |
| **Q.4** | ***Let T =***  *(a)*  ***B B'***  *(b)*  ***B' (-1, 4)*** | M1  A1  M1  A1 |  |
|  |  | **04** |  |
| **Q.5** | *P(100 + RT) = 100 A*  *100P + PRT = 100A*  *PRT = 100 A – 100P*  *T =* | M1  M1  M1  A1 | Cross multiplication  Opening brackets correctly  Collecting like terms |
|  |  | **04** |  |
| **Q.6** | *Let B =*  *3a + c = 1 - - - - - - (i)*  *4a + 2c = 0 - - - - - (ii)*  *2(i) – (ii)*  *6a + 2c = 2*  *4a + 2c = 0 -*  *2a = 2*  *a = 1*  *3 + c = 1*  *c = - 2*  *Also*  *3b + d = 0 - - - - - (iii)*  *4b + 2d = 1 - - - - (iv)*  *(iv) – 2(iii)*  *4b + 2d = 1*  *6b + 2d = 0 -*  *-2b = 1*  *b =*  *-2 + 2d = 1*  *2d = 3*  *d =*  ***B =***  *OR*  *det of A = (3 x 2) – (4 x 1)*  *= 2*  *B = A-1 =*  *=* | M1  M1  A1A1  M1  A1  M1  A1 | M1 for his 2 |
|  |  | **04** |  |
| **Q.7** | *One exterior angle = 180 – 150*  *= 300*  *No. of sides = n*  *30n = 360*  *n = 12*  *Polygon is Decagon* | B1  M1  A1  B1 | n =  n = 12 |
|  |  | **04** |  |
| **Q.8** | *AB = 4.5 0.1*  *BC = 4.0 0.1*  *< ABC = 1350*  *AC = 7.9 cm ± 0.1*  *Accurate Drawing*  B  A  *4.5cm*  *4 cm*  C | M1  M1  M1  A1 | (4.4 – 4.6) cm  (3.9 – 4.1) cm  (7.8 – 8.0) cm |
|  |  | **04** |  |
| **Q.9** | *Points are (5, 0) (0, 3)*  *Gradient =*  *Equation is*  *5y – 15 = -3x*  *3x + 5y = 15*  ***Inequality is 3x + 5y ≤ 15*** | M1  A1  B2 | Accept  3x + 5y = 15  B2 on sight |
|  |  | **04** |  |
|  |  |  |  |
| **Q.10** | *Let M be married*  *P(M) =*  *P(M’) =*  *P(MM’) = P(M).P(M’) or P(M) P(M’)*  *=*  *= +*  *= or 0.48* | B1  M1M1  A1 | For *P(M’) =*  Accept 48% |
|  |  | **04** |  |
|  | ***SECTION B*** |  |  |
| **11.** | (**a)**  *=*  *P – Q =*  *=*  *(P + Q)(P – Q) =*  *=*  ***(b)***  ***x – y =1 - - - - - -(i)***  ***2x + y = 3 - - - - - (ii)***  *(i) + (ii)*  *3x = 4*  *x =*  *Substituting x = into (ii)*  *2() + y = 3*  *+ y = 3*  *y = 3 –*  *y =*  *=*  *= 4* | M1  A1  M1  A1  M1  A1  B1  M1  M1  A1  M1  A1 | For his  *For bothx = and x =* |
|  |  | **12** |  |
| **12.** | ***(i)*** *= 42 + 42 – 2 x 4 x 4 x Cos 600*  *= 32 – 32 x Cos 600*  *= 16*  *AB =*  *= 4 cm*  ***(ii)****42 = 102 + 102 – 2 x 10 x 10 Cos AOB*  *16 = 200 – 200 Cos AOB*  *Cos AOB = = 0.92*  *AOB = 23.1 0*  ***(iii)*** *Area of segment with 600 angle*  *= 600*  *= 8.381 – 6.928*  *= 1.453 cm2*  *Area of segment with 230 angle*  *= 0*  *= 20.08 – 19.54*  *= 0.54 cm2*  *Area of shaded region*  *1.453 + 0.54*  ***= 1.993 cm*** | M1  M1  A1  M1  M1  A1  M1  A1  M1  A1  M1W  A1 | AB = 2(4sin300)  = 2 x 4 x ½  4 cm  Sin AOC = or 0.2  *AOC = 115*  *AOB = 2 x*  *= 2 x 11.5*  *= 230*  *For his 1.453 or 0.54* |
|  |  | **12** |  |
| **13.** | |  |  |  |  |  | | --- | --- | --- | --- | --- | | *Score* | *f* | *cf* | *x* | *fx* | | *10-19*  *20-29*  *30-39*  *40-49*  *50-59*  *60-69*  *70-79*  *80-89* | *6*  *7*  *8*  *10*  *9*  *6*  *3*  *1* | *6*  *13*  *21*  *31*  *40*  *46*  *49*  *50* | *14.5*  *24.5*  *34.5*  *44.5*  *54.5*  *64.5*  *74.5*  *84.5* | *87.0*  *171.5*  *276.0*  *445.0*  *490.5*  *387.0*  *223.5*  *84.5* | |  |  |  |  |  |  1. *Modal Class is 40 – 49* 2. *Mean = =*   *= 43.3*   1. *Labelling horizontal axis as score and vertical axis as cumulative frequency*  * *Plotting all points correctly* * *Drawing smooth curve* * *Locating the median with horizontal and vertical lines* * *Reading the median score as 43.5 0.5*   *C:\Users\user pc\Desktop\SOLUTIONS TO JJEBS PAPER 1 2019\1.JPG* | M1  M1  M1  A1  B1  M1  A1  B1  M1  M1  M1  A1 | M1 for all *cf* column correct  M1 for all *x* column correct  M1 for all *fx* column correct  A1 for = 2165  Accept (39.5 – 49.5)  M1 for his 2165  Accept class boundary for horizontal axis  (43 to 44) |
|  |  | **12** |  |
| **14.** | *(a)*   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | *x* | *-2* | *-1* | *0* | *1* | *2* | *3* | | *2x2* | *8* | *2* | *0* | *2* | *8* | *18* | | *-x* | *2* | *1* | *0* | *-1* | *-2* | *-3* | | *-6* | *-6* | *-6* | *-6* | *-6* | *-6* | *-6* | | *y* | *2* | *-3* | *-6* | *-5* | *0* | *9* |   *-Correct scales used on both axes*  *-Plotting all points correctly*  *-Joining the points using a smooth curve*  *Subtracting 2x2 – 3x – 5 from y = 2x2 – x – 6 to obtain y = 2x – 1*  *i.e*  *y = 2x2 – x – 6 – 2x2 + 3x + 5*  *y = 2x – 1*  *Point for line y = 2x – 1*  *Drawing line y = 2x – 1*  *Solution occurs where line y = 2x – 1 meets the curve*  *i.e x = -1 0.1*  *or*  ***x = 2.5 0.1***  ***C:\Users\user pc\Desktop\SOLUTIONS TO JJEBS PAPER 1 2019\2.JPG*** | B1  B1  B1  B1  M1  M1  A1  B1  M1  A1  A1 | B1 for all 2x2 row correct  B1 for all –x row correct  (0,-1),(-2,-5),(-1,-3),(2,3),(3,5),(1,1)  (-1,1 to -0.9)  (2.4 to 2.6) |
|  |  | **12** |  |
| **15.** | *(a) A B C A’ B’ C’*  *(i)*  *A’(3, 1) B'(-1, 1) C’(-1, 2)*  *A’ B’ C’ A” B” C”*  *(ii)*  *A"(10, -6) B"(-2, 2) C"(-1, 2)*  *(b) ABC to A”B”C” is*  *=*  *A"B”C" To ABC is*  *Inverse of*  *det = (1 x 2) – (0 x -3)*  *= 2*  *Inverse =*  *=* | M1A1  A1  M1A1  A1  M1  A1  M1  A1  M1  A1 | For his 2 |
|  |  | **12** |  |
| **16.** | *(a)*  N  N  T  P  450  750  350km  250km  *Sketch*  *North line marked and 450 correctly drawn at T*  *= 7 cm 0.2cm*  *750 correctly drawn from north line at T*  *= 5 cm 0.2 cm*  *North line correctly drawn at P*  *North line correctly drawn at N*   1. *Bearing of P from N is*   *00700*  *(b) Time taken to fly directly from N to P is*  *= 3.75 hours 0.2*  ***Accurate Drawing***  ***C:\Users\user pc\Desktop\SOLUTIONS TO JJEBS PAPER 1 2019\3.JPG*** | B1  B1  M1  B1  M1  B1  B1  M1  A1  A1  M1  A1 | B1 for correct sketch to include all the given information  (6.8 – 7.2) cm  Accept 1200  (4.8 to 5.2) cm  (365 to 385) km  0060 to 0080  Accept 3 hr 45 min  (3.73 – 3.77 Hours) |
|  |  | **12** |  |
| **17.** | *(a)*  *x 8*  *y 7*  *6x + 5y 54*  *(b) Drawing line x = 24 and shading the correct unwanted region*  *Drawing line y = 7 and Shading the correct unwanted region*  *Drawing line 6x + 5y = 54 and shading the correct unwanted region*  *Correct unshaded region*  *(c)Cost function C = 300,000x + 100000y*  *Possible pairs*  *(7, 3) (6, 4) (5, 5) (4, 6)*  *(7, 3) gives 2,100,000 + 300,000 = 2, 4000,000*  *(6, 4) gives 1, 800,000 + 400,000 = 2,200,000*  *(5, 5) gives 1, 500,000 + 500,000 = 2,000,000*  *(4, 6) gives 1,200,000 + 600,000 = 1,800,000*  *The least cost occurs at 4 mini buses and 6 Noah vans and it is*  ***Shs. 1, 800, 000*** | M1  M1  M1  M1  M1  M1  A1  B1  B1  M1  M1  A1 | (9,0) (4, 6)  (4, 6) on sight scores B1M1M1.  Testing (4, 6) M1  A1 |
|  |  | **12** |  |

END