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| --- | --- |
| 1. The variables *x* and *y* , *x* > 0 , satisfy the differential equation . Using the substitution , show that the differential equation may reduced to . Hence find the particular solution for the given differential equation given | [ 10 ] |
| 1. (a) Show that, if tan     (b) When, tan  Deduce that,   1. If , cos , find the value of tan. | [ 3 ]  [ 4 ]  [ 3 ] |
| 1. The position vectors of the points ***A, B, C*** and ***D*** , relative to origin, are *x* ***i*** + 2 ***j*,**   *5* ***i*** + 10 ***j***, ***i*** + *y* ***j*** and -2 ***i*** + 4 ***j*** respectively. ***M*** is the mid-point of ***AB***. If ***DM***   is perpendicular to ***AB*,**   1. Find *x*. 2. If *CB* is parallel to *DM*, find *y* and . 3. *P, Q, M* and *N* are the mid points of *AB, AC, BE* an *CE* respectively.     Prove that,   1. *BC2PQ* 2. *PQ* | [ 6 ]  [ 6 ]  [ 5 ]  [ 2 ] |
| 1. In the given figure, *KBHL* is tangents to the circle *ABCE* and parallel to *AED. ACL* and *BCD* are straight lines. *AB* is parallel to *CH*.   Prove that | [ 3 ]  [ 5 ] |
| 1. During the checking of the printing of a Mathematics book, the number of misprints   per page has a Poisson distribution with mean 3.   1. Calculate the probability that a randomly chosen page has a perfect   printing. Give your answer correct to two decimal places.   1. If the whole book of 200 pages is checked. By using a suitable   approximation , calculate the probability that at least 3 pages has no  misprint.     1. X and Y are independent , normally distributed, random variables with the   following parameters.: X N (100 , 25) and Y N (80 , 20)  Calculate the following probabilities.  a) P (2X – Y > 110)  b) Find the value of *a* if P (X + Y < *a*) = 0.2085 | [ 2]  [ 4 ]  [ 3 ]  [ 4 ] |
| 1. The probability that Nasir take tuition for mathematics is 0.4. If he takes tuition, the probability that she will pass the mathematics paper is 0.8. If he does not take tuition, the probability that he will pass the mathematics paper is 0.3. 2. Find the probability that Nasir passes the mathematics paper. 3. Find the probability that Nasir takes tuition if he does not pass the   mathematics paper. | [ 3 ]  [ 3 ] |
| 1. Random variable X takes values -2, -1, 0, 1, 2 with probabilities *p*, *q*, 2*p*, 2*q*, 2*p*   respectively.  (a) Express *q* in terms of *p*.  (b) Find, in terms of *p*, the expected value of X. (c) If X1 , X2 and X3 are three independent observations of X. Find E (Y)  where Y = X1 + X2 + X3 , in terms of *p*. (d) If *p* = , find P (X1 + X2 = 3). | [ 2 ]  [ 2 ]  [ 2 ]  [ 4 ] |
| 10. The cumulative distribution function for a continuous random variable X is   given by  F (*x*) =  Find  (a) Find the value of *k*.  (b) P ( 2 < X < 3 )  (c) the probability density function for X.  (d) the mean of X. | [3]  [2]  [2]  [3] |
| 11. The incomes and the mode of transportation to work of 200 workers in a certain factory are shown in the following table.   |  |  |  | | --- | --- | --- | | Income | Transportation  (number of workers) | | |  | Bus | Car | | More than RM 1000 | 100 | 25 | | Less than RM 1000 | 60 | 15 |   A worker is selected from the group. Find the probability that   1. If the worker income’s is at least RM 1000 ,find the probability that the worker drove a car to work 2. the worker income’s is less than RM 1000, given that the worker went to work by bus. | [3]  [3] |
| 12. A sample of 200 an electronic part nominally have a life-span of 12 months are  selected for test. .The recorded time tested on the sample are shown in the  following table.   |  |  | | --- | --- | | Months | Number of electronic parts | | < 9 | 0 | | < 10 | 16 | | < 11 | 44 | | < 12 | 66 | | < 13 | 50 | | < 14 | 18 | | < 15 | 4 | | <16 | 2 |  1. Calculate the estimates mean, mode and median 2. Comment on the distribution | [ 9 ]  [ 2 ] |

***End of questions***





