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**15/ENG07/008**

**CHEMICAL ENGINEERING**

**ENGINEERING MATHEMATICS**

**SOLUTION TO TEST QIUESTIONS**

**QUESTION 1A**

clc

clear

x = 0:0.001:15

a = x.^2

b = x.^3

c = x.^4

y = ((a)/192)-((b)/720)+((c)/4200)

plot (x,y)

xlabel('X')

ylabel('Y')

grid on

grid minor



QUESTION 1B

Formula for n = (2.07\*EXP(4\*A2))+(2.93\*EXP(-3\*F3A2)) (12\*A2^3)+(3\*A2^2)-(6.5\*A2)

|  |  |
| --- | --- |
| time in hours | amount of product, n |
| 0 | 5 |
| 0.01 | 4.933171716 |
| 0.02 | 4.872878313 |
| 0.03 | 4.819112856 |
| 0.04 | 4.771876383 |
| 0.05 | 4.73117808 |
| 0.06 | 4.697035461 |
| 0.07 | 4.669474552 |
| 0.08 | 4.648530105 |
| 0.09 | 4.634245807 |
| 0.1 | 4.626674511 |
| 0.11 | 4.625878481 |
| 0.12 | 4.631929648 |
| 0.13 | 4.644909877 |
| 0.14 | 4.664911258 |
| 0.15 | 4.692036401 |
| 0.16 | 4.726398758 |
| 0.17 | 4.768122952 |
| 0.18 | 4.817345125 |
| 0.19 | 4.874213312 |
| 0.2 | 4.938887816 |
| 0.21 | 5.011541619 |
| 0.22 | 5.092360802 |
| 0.23 | 5.18154499 |
| 0.24 | 5.27930781 |
| 0.25 | 5.385877384 |
| 0.26 | 5.501496833 |
| 0.27 | 5.626424805 |
| 0.28 | 5.760936034 |
| 0.29 | 5.905321921 |
| 0.3 | 6.059891133 |
| 0.31 | 6.224970243 |
| 0.32 | 6.400904388 |
| 0.33 | 6.588057956 |
| 0.34 | 6.786815309 |
| 0.35 | 6.997581536 |
| 0.36 | 7.220783231 |
| 0.37 | 7.456869315 |
| 0.38 | 7.706311888 |
| 0.39 | 7.969607115 |
| 0.4 | 8.247276159 |
| 0.41 | 8.539866143 |
| 0.42 | 8.847951158 |
| 0.43 | 9.172133316 |
| 0.44 | 9.513043841 |
| 0.45 | 9.871344215 |
| 0.46 | 10.24772736 |
| 0.47 | 10.64291888 |
| 0.48 | 11.05767836 |
| 0.49 | 11.4928007 |
| 0.5 | 11.94911749 |
| 0.51 | 12.42749855 |
| 0.52 | 12.92885334 |
| 0.53 | 13.45413264 |
| 0.54 | 14.00433014 |
| 0.55 | 14.58048418 |
| 0.56 | 15.18367951 |
| 0.57 | 15.81504922 |
| 0.58 | 16.47577659 |
| 0.59 | 17.16709716 |
| 0.6 | 17.89030085 |
| 0.61 | 18.64673409 |
| 0.62 | 19.43780215 |
| 0.63 | 20.26497149 |
| 0.64 | 21.12977224 |
| 0.65 | 22.03380076 |
| 0.66 | 22.97872233 |
| 0.67 | 23.96627394 |
| 0.68 | 24.99826717 |
| 0.69 | 26.07659124 |
| 0.7 | 27.20321615 |
| 0.71 | 28.38019593 |
| 0.72 | 29.60967209 |
| 0.73 | 30.89387712 |
| 0.74 | 32.23513822 |
| 0.75 | 33.63588116 |
| 0.76 | 35.09863422 |
| 0.77 | 36.62603243 |
| 0.78 | 38.22082184 |
| 0.79 | 39.8858641 |
| 0.8 | 41.62414111 |
| 0.81 | 43.43875994 |
| 0.82 | 45.3329579 |
| 0.83 | 47.31010786 |
| 0.84 | 49.37372377 |
| 0.85 | 51.52746638 |
| 0.86 | 53.77514924 |
| 0.87 | 56.12074491 |
| 0.88 | 58.56839144 |
| 0.89 | 61.12239911 |
| 0.9 | 63.78725745 |
| 0.91 | 66.56764254 |
| 0.92 | 69.46842461 |
| 0.93 | 72.49467596 |
| 0.94 | 75.65167919 |
| 0.95 | 78.94493576 |
| 0.96 | 82.38017495 |
| 0.97 | 85.96336309 |
| 0.98 | 89.70071328 |
| 0.99 | 93.59869541 |
| 1 | 97.66404668 |