

OLUKOYI GRACE

COMPUTER ENGINEERING

16/ENG02/045

ENG382

QUESTION 1

Code on MATLAB:

```
function taylor
t0=0;
tn=0.5;
h=0.1;
y0=1.4;
t=t0:h:tn;
y(1)=y0
n=length(t);
for i=1:n
    dy=(2*t(i))+(y(i)^2)
    y(i+1)=y(i)+h*dy
end
```

Output:

```
>> taylor
```

y =

1.4000

dy =

1.9600

y =

1.4000 1.5960

dy =

2.7472

y =

1.4000 1.5960 1.8707

dy =

3.8996

$y =$

1.4000 1.5960 1.8707 2.2607

$dy =$

5.7107

$y =$

1.4000 1.5960 1.8707 2.2607 2.8317

$dy =$

8.8188

$y =$

1.4000 1.5960 1.8707 2.2607 2.8317 3.7136

dy =

14.7910

y =

1.4000 1.5960 1.8707 2.2607 2.8317 3.7136 5.1927

QUESTION 2

First code on MATLAB:

```
function dQdt = dupeak(t,Q)

dQdt(1) = (-0.15*Q(1)) + (0.005*Q(2)) + 1;

dQdt(2) = (0.03*Q(1)) - (0.018*Q(2)) + (0.0075*Q(3));

dQdt(3) = (0.013*Q(2)) - (0.0325*Q(3));

dQdt = dQdt'
```

Second code on MATLAB:

```
commandwindow
```

```
clear
```

```
clc
```

```

close all

format short g

[t,dQ] = ode45('dupeak',[0 1200],[0 0 0])

tablee = table(t,dQ)

plot(t,dQ(:,1),'b-')

hold on

plot(t,dQ(:,2),'r-')

hold on

plot(t,dQ(:,3),'g-')

xlabel('time(min)')

ylabel('dynamic response')

grid on

grid minor

axis tight

legend('y_1','y_2','y_3')

```

OUTPUT:

dQ =

| | 0 | 0 | 0 |
|--|------------|------------|------------|
| | 5.0238e-05 | 3.7857e-11 | 8.2414e-18 |
| | 0.00010047 | 1.5143e-10 | 6.5931e-17 |
| | 0.00015071 | 3.4071e-10 | 2.2252e-16 |
| | 0.00020095 | 6.0571e-10 | 5.2745e-16 |
| | 0.00045212 | 3.0664e-09 | 6.0079e-15 |

| | | |
|------------|------------|------------|
| 0.00070329 | 7.4198e-09 | 2.2614e-14 |
| 0.00095445 | 1.3666e-08 | 5.6525e-14 |
| 0.0012056 | 2.1804e-08 | 1.1392e-13 |
| 0.0024612 | 9.0883e-08 | 9.6948e-13 |
| 0.0037166 | 2.0726e-07 | 3.339e-12 |
| 0.0049717 | 3.7094e-07 | 7.9947e-12 |
| 0.0062266 | 5.8189e-07 | 1.5708e-11 |
| 0.012497 | 2.3456e-06 | 1.2715e-10 |
| 0.018762 | 5.2898e-06 | 4.3073e-10 |
| 0.025022 | 9.4133e-06 | 1.0227e-09 |
| 0.031275 | 1.4715e-05 | 1.9993e-09 |
| 0.062453 | 5.8851e-05 | 1.6008e-08 |
| 0.093484 | 0.00013225 | 5.3984e-08 |
| 0.12437 | 0.00023477 | 1.2781e-07 |
| 0.15511 | 0.00036624 | 2.493e-07 |
| 0.30666 | 0.0014526 | 1.9802e-06 |
| 0.45468 | 0.0032404 | 6.6314e-06 |
| 0.59926 | 0.0057112 | 1.5597e-05 |
| 0.74048 | 0.0088471 | 3.0227e-05 |
| 1.1639 | 0.022864 | 0.0001278 |
| 1.5571 | 0.042782 | 0.00033219 |
| 1.9223 | 0.068119 | 0.0006776 |
| 2.2614 | 0.098429 | 0.0011951 |
| 2.5916 | 0.13515 | 0.0019542 |
| 2.8971 | 0.17646 | 0.0029617 |

| | | |
|--------|---------|-----------|
| 3.1799 | 0.22195 | 0.0042427 |
| 3.4416 | 0.27123 | 0.0058195 |
| 3.7884 | 0.3491 | 0.0086858 |
| 4.0984 | 0.43333 | 0.01227 |
| 4.3754 | 0.52305 | 0.016611 |
| 4.623 | 0.61749 | 0.021741 |
| 4.9209 | 0.7535 | 0.030111 |
| 5.1765 | 0.8956 | 0.040049 |
| 5.3958 | 1.0425 | 0.05157 |
| 5.5842 | 1.193 | 0.064683 |
| 5.7976 | 1.4001 | 0.084875 |
| 5.9719 | 1.6102 | 0.10788 |
| 6.114 | 1.8221 | 0.1336 |
| 6.2305 | 2.0342 | 0.16195 |
| 6.354 | 2.3126 | 0.20313 |
| 6.4498 | 2.5884 | 0.24836 |
| 6.5237 | 2.8606 | 0.29731 |
| 6.5818 | 3.1282 | 0.34969 |
| 6.6363 | 3.4358 | 0.41523 |
| 6.6783 | 3.7358 | 0.48457 |
| 6.7107 | 4.028 | 0.55723 |
| 6.7366 | 4.3121 | 0.63278 |
| 6.7635 | 4.6524 | 0.72974 |
| 6.7851 | 4.9805 | 0.82976 |
| 6.8024 | 5.2968 | 0.93218 |

| | | |
|--------|--------|--------|
| 6.8173 | 5.6015 | 1.0364 |
| 6.8349 | 5.9734 | 1.171 |
| 6.8502 | 6.328 | 1.3067 |
| 6.8633 | 6.6664 | 1.4427 |
| 6.8755 | 6.9894 | 1.5782 |
| 6.8916 | 7.3974 | 1.7575 |
| 6.9062 | 7.7811 | 1.9339 |
| 6.9191 | 8.1422 | 2.1066 |
| 6.9312 | 8.4822 | 2.2747 |
| 6.9483 | 8.9147 | 2.4962 |
| 6.9633 | 9.3136 | 2.7075 |
| 6.9753 | 9.6822 | 2.9082 |
| 6.9868 | 10.023 | 3.0981 |
| 7.0065 | 10.385 | 3.3056 |
| 7.0203 | 10.716 | 3.4986 |
| 7.0221 | 11.022 | 3.6775 |
| 7.0273 | 11.3 | 3.8432 |
| 7.0378 | 11.454 | 3.9369 |
| 7.0455 | 11.6 | 4.0262 |
| 7.0494 | 11.739 | 4.1111 |
| 7.0531 | 11.871 | 4.1919 |
| 7.0591 | 11.996 | 4.2689 |
| 7.0641 | 12.114 | 4.3422 |
| 7.0678 | 12.227 | 4.4118 |
| 7.0714 | 12.333 | 4.478 |

| | | |
|--------|--------|--------|
| 7.0774 | 12.467 | 4.5619 |
| 7.0824 | 12.592 | 4.6402 |
| 7.0854 | 12.709 | 4.7133 |
| 7.0886 | 12.818 | 4.7814 |
| 7.0978 | 12.938 | 4.8583 |
| 7.1031 | 13.05 | 4.9289 |
| 7.1002 | 13.154 | 4.9936 |
| 7.1001 | 13.248 | 5.053 |
| 7.1062 | 13.304 | 5.089 |
| 7.1099 | 13.357 | 5.1231 |
| 7.1102 | 13.408 | 5.1552 |
| 7.1108 | 13.457 | 5.1856 |
| 7.114 | 13.502 | 5.2144 |
| 7.1163 | 13.544 | 5.2417 |
| 7.1171 | 13.585 | 5.2674 |
| 7.118 | 13.623 | 5.2917 |
| 7.1211 | 13.668 | 5.3208 |
| 7.1232 | 13.711 | 5.348 |
| 7.1231 | 13.751 | 5.3731 |
| 7.1236 | 13.788 | 5.3966 |
| 7.1298 | 13.827 | 5.422 |
| 7.1325 | 13.863 | 5.4453 |
| 7.1273 | 13.898 | 5.4665 |
| 7.1249 | 13.929 | 5.4861 |
| 7.1297 | 13.948 | 5.4988 |

| | | |
|--------|--------|--------|
| 7.1322 | 13.967 | 5.5108 |
| 7.1312 | 13.985 | 5.522 |
| 7.1305 | 14.001 | 5.5326 |
| 7.1327 | 14.017 | 5.5427 |
| 7.134 | 14.032 | 5.5522 |
| 7.1338 | 14.046 | 5.5611 |
| 7.1338 | 14.059 | 5.5696 |
| 7.1359 | 14.074 | 5.5795 |
| 7.1369 | 14.089 | 5.5887 |
| 7.1359 | 14.102 | 5.5973 |
| 7.1354 | 14.115 | 5.6052 |
| 7.1404 | 14.127 | 5.6139 |
| 7.1421 | 14.139 | 5.6217 |
| 7.1367 | 14.152 | 5.6288 |
| 7.1338 | 14.163 | 5.6354 |
| 7.138 | 14.169 | 5.6399 |
| 7.1399 | 14.176 | 5.6442 |
| 7.1384 | 14.182 | 5.648 |
| 7.1372 | 14.188 | 5.6517 |
| 7.1392 | 14.193 | 5.6553 |
| 7.1402 | 14.198 | 5.6586 |
| 7.1395 | 14.203 | 5.6617 |
| 7.1391 | 14.208 | 5.6647 |
| 7.1409 | 14.213 | 5.6681 |
| 7.1417 | 14.218 | 5.6712 |

| | | |
|--------|--------|--------|
| 7.1402 | 14.223 | 5.6741 |
| 7.1394 | 14.227 | 5.6768 |
| 7.1439 | 14.231 | 5.6798 |
| 7.1454 | 14.235 | 5.6825 |
| 7.14 | 14.24 | 5.6848 |
| 7.1369 | 14.244 | 5.687 |
| 7.1457 | 14.245 | 5.6891 |
| 7.1488 | 14.247 | 5.6909 |
| 7.1397 | 14.252 | 5.6924 |
| 7.1341 | 14.256 | 5.6937 |
| 7.1409 | 14.256 | 5.6951 |
| 7.1439 | 14.257 | 5.6962 |
| 7.1407 | 14.259 | 5.6972 |
| 7.1383 | 14.261 | 5.6981 |
| 7.141 | 14.262 | 5.699 |
| 7.1423 | 14.263 | 5.6998 |
| 7.1415 | 14.264 | 5.7006 |
| 7.1409 | 14.266 | 5.7013 |
| 7.1424 | 14.267 | 5.7021 |
| 7.143 | 14.268 | 5.7029 |
| 7.142 | 14.269 | 5.7036 |
| 7.1413 | 14.27 | 5.7042 |
| 7.1439 | 14.271 | 5.705 |
| 7.1448 | 14.272 | 5.7057 |
| 7.1417 | 14.273 | 5.7063 |

| | | |
|--------|--------|--------|
| 7.14 | 14.275 | 5.7068 |
| 7.1472 | 14.274 | 5.7076 |
| 7.1494 | 14.274 | 5.7082 |
| 7.1406 | 14.277 | 5.7084 |
| 7.1355 | 14.279 | 5.7087 |
| 7.1443 | 14.277 | 5.7093 |
| 7.1477 | 14.277 | 5.7097 |
| 7.141 | 14.279 | 5.7098 |
| 7.1365 | 14.281 | 5.71 |
| 7.141 | 14.28 | 5.7103 |
| 7.143 | 14.28 | 5.7106 |
| 7.1417 | 14.28 | 5.7107 |
| 7.1406 | 14.281 | 5.7109 |
| 7.1424 | 14.281 | 5.7111 |
| 7.1431 | 14.281 | 5.7113 |
| 7.1424 | 14.281 | 5.7115 |
| 7.1418 | 14.282 | 5.7116 |
| 7.1434 | 14.282 | 5.7118 |
| 7.144 | 14.282 | 5.712 |
| 7.1424 | 14.282 | 5.7121 |
| 7.1414 | 14.283 | 5.7122 |
| 7.146 | 14.282 | 5.7125 |
| 7.1474 | 14.282 | 5.7127 |
| 7.1414 | 14.284 | 5.7127 |
| 7.1381 | 14.285 | 5.7127 |

| | | |
|--------|--------|--------|
| 7.1421 | 14.284 | 5.7129 |
| 7.1439 | 14.283 | 5.713 |
| 7.142 | 14.284 | 5.713 |
| 7.1407 | 14.284 | 5.7131 |
| 7.1425 | 14.284 | 5.7132 |
| 7.1433 | 14.284 | 5.7133 |
| 7.1425 | 14.284 | 5.7133 |
| 7.1419 | 14.284 | 5.7133 |
| 7.1435 | 14.284 | 5.7135 |
| 7.1441 | 14.284 | 5.7135 |
| 7.1425 | 14.285 | 5.7135 |
| 7.1414 | 14.285 | 5.7136 |
| 7.1458 | 14.284 | 5.7137 |
| 7.1471 | 14.284 | 5.7138 |
| 7.1416 | 14.285 | 5.7137 |
| 7.1385 | 14.286 | 5.7137 |
| 7.1472 | 14.284 | 5.7139 |
| 7.1501 | 14.283 | 5.714 |
| 7.1409 | 14.286 | 5.7138 |
| 7.1352 | 14.287 | 5.7137 |
| 7.142 | 14.285 | 5.7139 |
| 7.1449 | 14.285 | 5.714 |
| 7.1416 | 14.286 | 5.7139 |
| 7.1391 | 14.286 | 5.7139 |
| 7.1418 | 14.286 | 5.714 |

| | | |
|--------|--------|--------|
| 7.1431 | 14.285 | 5.714 |
| 7.1423 | 14.285 | 5.714 |
| 7.1416 | 14.286 | 5.714 |
| 7.143 | 14.285 | 5.7141 |
| 7.1436 | 14.285 | 5.7141 |
| 7.1426 | 14.285 | 5.7141 |
| 7.1419 | 14.286 | 5.7141 |
| 7.1444 | 14.285 | 5.7142 |
| 7.1452 | 14.285 | 5.7142 |
| 7.1422 | 14.286 | 5.7141 |
| 7.1404 | 14.286 | 5.7141 |
| 7.1476 | 14.284 | 5.7143 |
| 7.1497 | 14.284 | 5.7143 |
| 7.1409 | 14.286 | 5.7141 |
| 7.1358 | 14.287 | 5.714 |
| 7.1446 | 14.285 | 5.7142 |
| 7.148 | 14.284 | 5.7143 |
| 7.1413 | 14.286 | 5.7142 |
| 7.1367 | 14.287 | 5.7141 |
| 7.1412 | 14.286 | 5.7142 |
| 7.1432 | 14.286 | 5.7142 |
| 7.1419 | 14.286 | 5.7142 |
| 7.1408 | 14.286 | 5.7142 |
| 7.1425 | 14.286 | 5.7142 |
| 7.1433 | 14.286 | 5.7142 |

| | | |
|--------|--------|--------|
| 7.1425 | 14.286 | 5.7142 |
| 7.142 | 14.286 | 5.7142 |
| 7.1436 | 14.285 | 5.7143 |
| 7.1441 | 14.285 | 5.7143 |
| 7.1425 | 14.286 | 5.7142 |
| 7.1415 | 14.286 | 5.7142 |
| 7.1461 | 14.285 | 5.7143 |
| 7.1474 | 14.285 | 5.7144 |
| 7.1415 | 14.286 | 5.7142 |
| 7.1382 | 14.287 | 5.7141 |
| 7.1422 | 14.286 | 5.7142 |
| 7.1439 | 14.285 | 5.7143 |
| 7.1421 | 14.286 | 5.7142 |
| 7.1407 | 14.286 | 5.7142 |
| 7.1426 | 14.286 | 5.7143 |
| 7.1433 | 14.286 | 5.7143 |
| 7.1425 | 14.286 | 5.7143 |
| 7.1419 | 14.286 | 5.7142 |
| 7.1436 | 14.286 | 5.7143 |
| 7.1441 | 14.285 | 5.7143 |
| 7.1425 | 14.286 | 5.7143 |
| 7.1415 | 14.286 | 5.7142 |
| 7.1458 | 14.285 | 5.7143 |
| 7.1471 | 14.285 | 5.7144 |
| 7.1416 | 14.286 | 5.7142 |

| | | |
|--------|--------|--------|
| 7.1385 | 14.287 | 5.7142 |
| 7.1472 | 14.285 | 5.7144 |
| 7.1501 | 14.284 | 5.7145 |
| 7.1409 | 14.286 | 5.7142 |
| 7.1353 | 14.287 | 5.7141 |
| 7.142 | 14.286 | 5.7143 |
| 7.1449 | 14.285 | 5.7143 |
| 7.1416 | 14.286 | 5.7142 |
| 7.1392 | 14.287 | 5.7142 |
| 7.1417 | 14.286 | 5.7143 |
| 7.1429 | 14.286 | 5.7143 |
| 7.1423 | 14.286 | 5.7143 |
| 7.1417 | 14.286 | 5.7143 |

tablee =

269×2 table

| t | dQ | | |
|------------|------------|------------|------------|
| | | | |
| 0 | 0 | 0 | 0 |
| 5.0238e-05 | 5.0238e-05 | 3.7857e-11 | 8.2414e-18 |
| 0.00010048 | 0.00010047 | 1.5143e-10 | 6.5931e-17 |

| | | | |
|------------|------------|------------|------------|
| 0.00015071 | 0.00015071 | 3.4071e-10 | 2.2252e-16 |
| 0.00020095 | 0.00020095 | 6.0571e-10 | 5.2745e-16 |
| 0.00045214 | 0.00045212 | 3.0664e-09 | 6.0079e-15 |
| 0.00070333 | 0.00070329 | 7.4198e-09 | 2.2614e-14 |
| 0.00095452 | 0.00095445 | 1.3666e-08 | 5.6525e-14 |
| 0.0012057 | 0.0012056 | 2.1804e-08 | 1.1392e-13 |
| 0.0024616 | 0.0024612 | 9.0883e-08 | 9.6948e-13 |
| 0.0037176 | 0.0037166 | 2.0726e-07 | 3.339e-12 |
| 0.0049735 | 0.0049717 | 3.7094e-07 | 7.9947e-12 |
| 0.0062295 | 0.0062266 | 5.8189e-07 | 1.5708e-11 |
| 0.012509 | 0.012497 | 2.3456e-06 | 1.2715e-10 |
| 0.018789 | 0.018762 | 5.2898e-06 | 4.3073e-10 |
| 0.025069 | 0.025022 | 9.4133e-06 | 1.0227e-09 |
| 0.031348 | 0.031275 | 1.4715e-05 | 1.9993e-09 |
| 0.062747 | 0.062453 | 5.8851e-05 | 1.6008e-08 |
| 0.094146 | 0.093484 | 0.00013225 | 5.3984e-08 |
| 0.12554 | 0.12437 | 0.00023477 | 1.2781e-07 |
| 0.15694 | 0.15511 | 0.00036624 | 2.493e-07 |
| 0.31394 | 0.30666 | 0.0014526 | 1.9802e-06 |
| 0.47093 | 0.45468 | 0.0032404 | 6.6314e-06 |
| 0.62792 | 0.59926 | 0.0057112 | 1.5597e-05 |
| 0.78491 | 0.74048 | 0.0088471 | 3.0227e-05 |
| 1.2791 | 1.1639 | 0.022864 | 0.0001278 |
| 1.7732 | 1.5571 | 0.042782 | 0.00033219 |
| 2.2674 | 1.9223 | 0.068119 | 0.0006776 |

| | | | |
|--------|--------|----------|-----------|
| 2.7615 | 2.2614 | 0.098429 | 0.0011951 |
| 3.2804 | 2.5916 | 0.13515 | 0.0019542 |
| 3.7993 | 2.8971 | 0.17646 | 0.0029617 |
| 4.3182 | 3.1799 | 0.22195 | 0.0042427 |
| 4.8371 | 3.4416 | 0.27123 | 0.0058195 |
| 5.593 | 3.7884 | 0.3491 | 0.0086858 |
| 6.3489 | 4.0984 | 0.43333 | 0.01227 |
| 7.1048 | 4.3754 | 0.52305 | 0.016611 |
| 7.8606 | 4.623 | 0.61749 | 0.021741 |
| 8.898 | 4.9209 | 0.7535 | 0.030111 |
| 9.9354 | 5.1765 | 0.8956 | 0.040049 |
| 10.973 | 5.3958 | 1.0425 | 0.05157 |
| 12.01 | 5.5842 | 1.193 | 0.064683 |
| 13.409 | 5.7976 | 1.4001 | 0.084875 |
| 14.808 | 5.9719 | 1.6102 | 0.10788 |
| 16.207 | 6.114 | 1.8221 | 0.1336 |
| 17.606 | 6.2305 | 2.0342 | 0.16195 |
| 19.449 | 6.354 | 2.3126 | 0.20313 |
| 21.292 | 6.4498 | 2.5884 | 0.24836 |
| 23.135 | 6.5237 | 2.8606 | 0.29731 |
| 24.978 | 6.5818 | 3.1282 | 0.34969 |
| 27.144 | 6.6363 | 3.4358 | 0.41523 |
| 29.31 | 6.6783 | 3.7358 | 0.48457 |
| 31.476 | 6.7107 | 4.028 | 0.55723 |
| 33.641 | 6.7366 | 4.3121 | 0.63278 |

| | | | |
|--------|--------|--------|---------|
| 36.323 | 6.7635 | 4.6524 | 0.72974 |
| 39.005 | 6.7851 | 4.9805 | 0.82976 |
| 41.687 | 6.8024 | 5.2968 | 0.93218 |
| 44.369 | 6.8173 | 5.6015 | 1.0364 |
| 47.786 | 6.8349 | 5.9734 | 1.171 |
| 51.202 | 6.8502 | 6.328 | 1.3067 |
| 54.618 | 6.8633 | 6.6664 | 1.4427 |
| 58.035 | 6.8755 | 6.9894 | 1.5782 |
| 62.594 | 6.8916 | 7.3974 | 1.7575 |
| 67.154 | 6.9062 | 7.7811 | 1.9339 |
| 71.713 | 6.9191 | 8.1422 | 2.1066 |
| 76.273 | 6.9312 | 8.4822 | 2.2747 |
| 82.502 | 6.9483 | 8.9147 | 2.4962 |
| 88.731 | 6.9633 | 9.3136 | 2.7075 |
| 94.96 | 6.9753 | 9.6822 | 2.9082 |
| 101.19 | 6.9868 | 10.023 | 3.0981 |
| 108.44 | 7.0065 | 10.385 | 3.3056 |
| 115.7 | 7.0203 | 10.716 | 3.4986 |
| 122.95 | 7.0221 | 11.022 | 3.6775 |
| 130.2 | 7.0273 | 11.3 | 3.8432 |
| 134.57 | 7.0378 | 11.454 | 3.9369 |
| 138.93 | 7.0455 | 11.6 | 4.0262 |
| 143.29 | 7.0494 | 11.739 | 4.1111 |
| 147.66 | 7.0531 | 11.871 | 4.1919 |
| 152.02 | 7.0591 | 11.996 | 4.2689 |

| | | | |
|--------|--------|--------|--------|
| 156.38 | 7.0641 | 12.114 | 4.3422 |
| 160.74 | 7.0678 | 12.227 | 4.4118 |
| 165.11 | 7.0714 | 12.333 | 4.478 |
| 170.97 | 7.0774 | 12.467 | 4.5619 |
| 176.84 | 7.0824 | 12.592 | 4.6402 |
| 182.7 | 7.0854 | 12.709 | 4.7133 |
| 188.56 | 7.0886 | 12.818 | 4.7814 |
| 195.7 | 7.0978 | 12.938 | 4.8583 |
| 202.83 | 7.1031 | 13.05 | 4.9289 |
| 209.96 | 7.1002 | 13.154 | 4.9936 |
| 217.09 | 7.1001 | 13.248 | 5.053 |
| 221.72 | 7.1062 | 13.304 | 5.089 |
| 226.35 | 7.1099 | 13.357 | 5.1231 |
| 230.97 | 7.1102 | 13.408 | 5.1552 |
| 235.6 | 7.1108 | 13.457 | 5.1856 |
| 240.22 | 7.114 | 13.502 | 5.2144 |
| 244.85 | 7.1163 | 13.544 | 5.2417 |
| 249.48 | 7.1171 | 13.585 | 5.2674 |
| 254.1 | 7.118 | 13.623 | 5.2917 |
| 259.99 | 7.1211 | 13.668 | 5.3208 |
| 265.88 | 7.1232 | 13.711 | 5.348 |
| 271.77 | 7.1231 | 13.751 | 5.3731 |
| 277.66 | 7.1236 | 13.788 | 5.3966 |
| 284.5 | 7.1298 | 13.827 | 5.422 |
| 291.34 | 7.1325 | 13.863 | 5.4453 |

| | | | |
|--------|--------|--------|--------|
| 298.18 | 7.1273 | 13.898 | 5.4665 |
| 305.01 | 7.1249 | 13.929 | 5.4861 |
| 309.7 | 7.1297 | 13.948 | 5.4988 |
| 314.39 | 7.1322 | 13.967 | 5.5108 |
| 319.08 | 7.1312 | 13.985 | 5.522 |
| 323.77 | 7.1305 | 14.001 | 5.5326 |
| 328.46 | 7.1327 | 14.017 | 5.5427 |
| 333.15 | 7.134 | 14.032 | 5.5522 |
| 337.84 | 7.1338 | 14.046 | 5.5611 |
| 342.53 | 7.1338 | 14.059 | 5.5696 |
| 348.37 | 7.1359 | 14.074 | 5.5795 |
| 354.2 | 7.1369 | 14.089 | 5.5887 |
| 360.04 | 7.1359 | 14.102 | 5.5973 |
| 365.87 | 7.1354 | 14.115 | 5.6052 |
| 372.57 | 7.1404 | 14.127 | 5.6139 |
| 379.28 | 7.1421 | 14.139 | 5.6217 |
| 385.98 | 7.1367 | 14.152 | 5.6288 |
| 392.69 | 7.1338 | 14.163 | 5.6354 |
| 397.46 | 7.138 | 14.169 | 5.6399 |
| 402.22 | 7.1399 | 14.176 | 5.6442 |
| 406.99 | 7.1384 | 14.182 | 5.648 |
| 411.76 | 7.1372 | 14.188 | 5.6517 |
| 416.53 | 7.1392 | 14.193 | 5.6553 |
| 421.3 | 7.1402 | 14.198 | 5.6586 |
| 426.06 | 7.1395 | 14.203 | 5.6617 |

| | | | |
|--------|--------|--------|--------|
| 430.83 | 7.1391 | 14.208 | 5.6647 |
| 436.64 | 7.1409 | 14.213 | 5.6681 |
| 442.45 | 7.1417 | 14.218 | 5.6712 |
| 448.26 | 7.1402 | 14.223 | 5.6741 |
| 454.07 | 7.1394 | 14.227 | 5.6768 |
| 460.65 | 7.1439 | 14.231 | 5.6798 |
| 467.23 | 7.1454 | 14.235 | 5.6825 |
| 473.82 | 7.14 | 14.24 | 5.6848 |
| 480.4 | 7.1369 | 14.244 | 5.687 |
| 486.37 | 7.1457 | 14.245 | 5.6891 |
| 492.35 | 7.1488 | 14.247 | 5.6909 |
| 498.32 | 7.1397 | 14.252 | 5.6924 |
| 504.3 | 7.1341 | 14.256 | 5.6937 |
| 509.12 | 7.1409 | 14.256 | 5.6951 |
| 513.94 | 7.1439 | 14.257 | 5.6962 |
| 518.77 | 7.1407 | 14.259 | 5.6972 |
| 523.59 | 7.1383 | 14.261 | 5.6981 |
| 528.07 | 7.141 | 14.262 | 5.699 |
| 532.55 | 7.1423 | 14.263 | 5.6998 |
| 537.04 | 7.1415 | 14.264 | 5.7006 |
| 541.52 | 7.1409 | 14.266 | 5.7013 |
| 546.76 | 7.1424 | 14.267 | 5.7021 |
| 552.01 | 7.143 | 14.268 | 5.7029 |
| 557.25 | 7.142 | 14.269 | 5.7036 |
| 562.49 | 7.1413 | 14.27 | 5.7042 |

| | | | |
|--------|--------|--------|--------|
| 568.86 | 7.1439 | 14.271 | 5.705 |
| 575.23 | 7.1448 | 14.272 | 5.7057 |
| 581.6 | 7.1417 | 14.273 | 5.7063 |
| 587.97 | 7.14 | 14.275 | 5.7068 |
| 594.44 | 7.1472 | 14.274 | 5.7076 |
| 600.92 | 7.1494 | 14.274 | 5.7082 |
| 607.39 | 7.1406 | 14.277 | 5.7084 |
| 613.87 | 7.1355 | 14.279 | 5.7087 |
| 619.21 | 7.1443 | 14.277 | 5.7093 |
| 624.54 | 7.1477 | 14.277 | 5.7097 |
| 629.88 | 7.141 | 14.279 | 5.7098 |
| 635.22 | 7.1365 | 14.281 | 5.71 |
| 639.69 | 7.141 | 14.28 | 5.7103 |
| 644.17 | 7.143 | 14.28 | 5.7106 |
| 648.64 | 7.1417 | 14.28 | 5.7107 |
| 653.12 | 7.1406 | 14.281 | 5.7109 |
| 657.86 | 7.1424 | 14.281 | 5.7111 |
| 662.59 | 7.1431 | 14.281 | 5.7113 |
| 667.33 | 7.1424 | 14.281 | 5.7115 |
| 672.07 | 7.1418 | 14.282 | 5.7116 |
| 677.93 | 7.1434 | 14.282 | 5.7118 |
| 683.79 | 7.144 | 14.282 | 5.712 |
| 689.64 | 7.1424 | 14.282 | 5.7121 |
| 695.5 | 7.1414 | 14.283 | 5.7122 |
| 702.17 | 7.146 | 14.282 | 5.7125 |

| | | | |
|--------|--------|--------|--------|
| 708.83 | 7.1474 | 14.282 | 5.7127 |
| 715.5 | 7.1414 | 14.284 | 5.7127 |
| 722.17 | 7.1381 | 14.285 | 5.7127 |
| 726.93 | 7.1421 | 14.284 | 5.7129 |
| 731.69 | 7.1439 | 14.283 | 5.713 |
| 736.45 | 7.142 | 14.284 | 5.713 |
| 741.22 | 7.1407 | 14.284 | 5.7131 |
| 745.98 | 7.1425 | 14.284 | 5.7132 |
| 750.74 | 7.1433 | 14.284 | 5.7133 |
| 755.5 | 7.1425 | 14.284 | 5.7133 |
| 760.26 | 7.1419 | 14.284 | 5.7133 |
| 766.07 | 7.1435 | 14.284 | 5.7135 |
| 771.87 | 7.1441 | 14.284 | 5.7135 |
| 777.67 | 7.1425 | 14.285 | 5.7135 |
| 783.47 | 7.1414 | 14.285 | 5.7136 |
| 790.05 | 7.1458 | 14.284 | 5.7137 |
| 796.63 | 7.1471 | 14.284 | 5.7138 |
| 803.21 | 7.1416 | 14.285 | 5.7137 |
| 809.8 | 7.1385 | 14.286 | 5.7137 |
| 815.78 | 7.1472 | 14.284 | 5.7139 |
| 821.76 | 7.1501 | 14.283 | 5.714 |
| 827.74 | 7.1409 | 14.286 | 5.7138 |
| 833.73 | 7.1352 | 14.287 | 5.7137 |
| 838.56 | 7.142 | 14.285 | 5.7139 |
| 843.38 | 7.1449 | 14.285 | 5.714 |

| | | | |
|--------|--------|--------|--------|
| 848.21 | 7.1416 | 14.286 | 5.7139 |
| 853.04 | 7.1391 | 14.286 | 5.7139 |
| 857.52 | 7.1418 | 14.286 | 5.714 |
| 862 | 7.1431 | 14.285 | 5.714 |
| 866.49 | 7.1423 | 14.285 | 5.714 |
| 870.97 | 7.1416 | 14.286 | 5.714 |
| 876.2 | 7.143 | 14.285 | 5.7141 |
| 881.44 | 7.1436 | 14.285 | 5.7141 |
| 886.67 | 7.1426 | 14.285 | 5.7141 |
| 891.91 | 7.1419 | 14.286 | 5.7141 |
| 898.27 | 7.1444 | 14.285 | 5.7142 |
| 904.63 | 7.1452 | 14.285 | 5.7142 |
| 911 | 7.1422 | 14.286 | 5.7141 |
| 917.36 | 7.1404 | 14.286 | 5.7141 |
| 923.84 | 7.1476 | 14.284 | 5.7143 |
| 930.32 | 7.1497 | 14.284 | 5.7143 |
| 936.8 | 7.1409 | 14.286 | 5.7141 |
| 943.28 | 7.1358 | 14.287 | 5.714 |
| 948.63 | 7.1446 | 14.285 | 5.7142 |
| 953.97 | 7.148 | 14.284 | 5.7143 |
| 959.32 | 7.1413 | 14.286 | 5.7142 |
| 964.67 | 7.1367 | 14.287 | 5.7141 |
| 969.14 | 7.1412 | 14.286 | 5.7142 |
| 973.62 | 7.1432 | 14.286 | 5.7142 |
| 978.1 | 7.1419 | 14.286 | 5.7142 |

| | | | |
|--------|--------|--------|--------|
| 982.57 | 7.1408 | 14.286 | 5.7142 |
| 987.3 | 7.1425 | 14.286 | 5.7142 |
| 992.04 | 7.1433 | 14.286 | 5.7142 |
| 996.77 | 7.1425 | 14.286 | 5.7142 |
| 1001.5 | 7.142 | 14.286 | 5.7142 |
| 1007.4 | 7.1436 | 14.285 | 5.7143 |
| 1013.2 | 7.1441 | 14.285 | 5.7143 |
| 1019 | 7.1425 | 14.286 | 5.7142 |
| 1024.9 | 7.1415 | 14.286 | 5.7142 |
| 1031.6 | 7.1461 | 14.285 | 5.7143 |
| 1038.2 | 7.1474 | 14.285 | 5.7144 |
| 1044.9 | 7.1415 | 14.286 | 5.7142 |
| 1051.6 | 7.1382 | 14.287 | 5.7141 |
| 1056.3 | 7.1422 | 14.286 | 5.7142 |
| 1061.1 | 7.1439 | 14.285 | 5.7143 |
| 1065.9 | 7.1421 | 14.286 | 5.7142 |
| 1070.6 | 7.1407 | 14.286 | 5.7142 |
| 1075.4 | 7.1426 | 14.286 | 5.7143 |
| 1080.2 | 7.1433 | 14.286 | 5.7143 |
| 1084.9 | 7.1425 | 14.286 | 5.7143 |
| 1089.7 | 7.1419 | 14.286 | 5.7142 |
| 1095.5 | 7.1436 | 14.286 | 5.7143 |
| 1101.3 | 7.1441 | 14.285 | 5.7143 |
| 1107.1 | 7.1425 | 14.286 | 5.7143 |
| 1112.9 | 7.1415 | 14.286 | 5.7142 |

| | | | |
|--------|--------|--------|--------|
| 1119.5 | 7.1458 | 14.285 | 5.7143 |
| 1126.1 | 7.1471 | 14.285 | 5.7144 |
| 1132.6 | 7.1416 | 14.286 | 5.7142 |
| 1139.2 | 7.1385 | 14.287 | 5.7142 |
| 1145.2 | 7.1472 | 14.285 | 5.7144 |
| 1151.2 | 7.1501 | 14.284 | 5.7145 |
| 1157.1 | 7.1409 | 14.286 | 5.7142 |
| 1163.1 | 7.1353 | 14.287 | 5.7141 |
| 1167.9 | 7.142 | 14.286 | 5.7143 |
| 1172.8 | 7.1449 | 14.285 | 5.7143 |
| 1177.6 | 7.1416 | 14.286 | 5.7142 |
| 1182.4 | 7.1392 | 14.287 | 5.7142 |
| 1186.8 | 7.1417 | 14.286 | 5.7143 |
| 1191.2 | 7.1429 | 14.286 | 5.7143 |
| 1195.6 | 7.1423 | 14.286 | 5.7143 |
| 1200 | 7.1417 | 14.286 | 5.7143 |

