SULIT

KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI

BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI
KEMENTERIAN PENDIDIKAN TINGGI

JABATAN PERDAGANGAN

PEPERIKSAAN AKHIR

SESI II : 2022/2023

DPB20053: BUSINESS MATHEMATICS

TARIKH : 08 JUN 2023
MASA : 11.15 PG – 1.15 PTG (2 JAM)

Kertas ini mengandungi **SEPULUH (10)** halaman bercetak.

Struktur (4 soalan)

Dokumen sokongan yang disertakan : Jadual PVIF, Jadual PVIFA dan Formula

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JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

INSTRUCTION:

This section consists of **FOUR (4)** structured questions. Answer **ALL** questions.

ARAHAN:

*Bahagian ini mengandungi **EMPAT (4)** soalan berstruktur. Jawab **SEMUA** soalan.*

QUESTION 1

SOALAN 1

CLO1 a) Identify the value of variable for the equations below:

Kenalpasti nilai pembolehubah bagi persamaan-persamaan di bawah:

i. $4x + 10 = 70 - 2x$ [2 marks]
[*2 markah*]

ii. $7x - 6 = 1 - 2(2 - 2x)$ [3 marks]
[*3 markah*]

iii. $x^2 - 9x = -20$ [5 marks]
[*5 markah*]

CLO1 b)

i. Find the value of x, y and z for these simultaneous equations:

Cari nilai x, y dan z untuk persamaan serentak ini:

$$\begin{aligned} x - 3y + 2z &= 11 \\ 2x + 3y + z &= 1 \\ 2x - y - 3z &= 5 \end{aligned}$$

[10 marks]
[*10 markah*]

ii. Anggun Company Sdn Bhd produces a product for which the variable cost per unit is RM12 and fixed cost is RM120,000. Each unit has a selling price of RM22. Find the number of units that must be sold by the company in order to earn a profit of RM80,000.

Syarikat Anggun Sdn Bhd mengeluarkan satu keluaran dengan kos berubah seunit ialah RM12 dan kos tetap ialah RM120,000. Setiap unit dijual pada harga RM22. Cari bilangan unit yang perlu dijual oleh syarikat untuk memperoleh keuntungan sebanyak RM80,000.

[5 marks]
[*5 markah*]

QUESTION 2

SOALAN 2

I-Cheff Sdn Bhd has launched a new product in the market. Following are the cost involved in producing the products.

I-Cheff Sdn Bhd telah melancarkan produk baru di pasaran. Berikut adalah kos yang terlibat untuk menghasilkan produk tersebut.

Items ***Perkara***	**Cost / Price (RM)** ***Kos / Harga (RM)***
Variable cost per unit *Kos berubah per unit*	150
Fixed cost per annum *Kos tetap setahun*	50,000
Selling price for 100 units *Harga jualan untuk 100 unit*	40,000

Based on the information given:

Berdasarkan kepada maklumat yang diberikan:

CLO1 a) Count:

Kira:

i. break-even point in units and sales.

titik pulang modal dalam unit dan jualan.

[4 marks]
[*4 markah*]

ii. the units that need to be sold by the company to obtain a profit of RM225,000.

unit yang perlu dijual oleh syarikat untuk mendapatkan keuntungan sebanyak RM225,000.

[4 marks]
[*4 markah*]

CLO1 b) Simplify the following functions up to first derivatives:
Permudahkan fungsi berikut sehingga terbitan pertama:

i. $g(x) = 2x^3 - 12x^2 - 3x + 9$

[2 marks]
[*2 markah*]

ii. $c(x) = (4x^3 - 3x^2)(5x + 12)$

[3 marks]
[*3 markah*]

CLO1 c) Given the revenue function as $R(x) = 35x - 0.03x^2$, the total cost function as $C(x) = 6{,}000 + 5x$.
Diberi fungsi hasil adalah $R(x) = 35x - 0.03x^2$, manakala fungsi jumlah kos adalah $C(x) = 6{,}000 + 5x$.

You are required to calculate:
Anda dikehendaki untuk mengira:

i. profit function.
fungsi untung.

[3 marks]
[*3 markah*]

ii. level of output that will maximize profit.
bilangan unit yang akan memaksimumkan keuntungan.

[3 marks]
[*3 markah*]

iii. the price at the level of profit maximization.
harga pada paras maksimum keuntungan.

[3 marks]
[*3 markah*]

iv. the profit when the profit is maximized.
keuntungan pada paras maksimum keuntungan.

[3 marks]
[*3 markah*]

QUESTION 3
SOALAN 3

CLO2 a) Define the promissory note.
Definisikan nota janji.

[2 marks]
[*2 markah*]

CLO2 b) Laili Tamplom plans to buy herself a laptop which will cost her RM7,600. If she wants to pay as monthly instalment, she needs to pay a down payment of 10% as cash. The balance will be paid through instalment basis for 3 years at 5% interest rate per annum. You are required to find:
Laili Tamplom merancang untuk membeli komputer riba yang berharga RM7,600. Jika dia ingin membayar secara bulanan, dia perlu membuat bayaran muka sebanyak 10% daripada harga tunai. Baki akan dibayar secara ansuran selama 3 tahun pada kadar faedah 5% setahun. Anda dikehendaki untuk mencari:

i. total interest.
jumlah faedah.

[3 marks]
[*3 markah*]

ii. instalment price.
harga ansuran.

[3 marks]
[*3 markah*]

iii. monthly payment.
bayaran bulanan.

[2 marks]
[*2 markah*]

CLO2 c) Mrs Amni and husband plan to build a bungalow residence with a price of RM4,500,000 for the family. For this purpose, they have talked with Global Finance. They agreed to pay RM500,000 as advance payment. Interest is charged at the rate of 5% per annum. Other payments to be settled include legal fees of RM50,000 and insurance of RM800,000. Mrs Amni agrees to pay for the house for a period of 30 years.

Puan Amni dan suami bercadang untuk membina kediaman banglo untuk keluarganya dengan harga RM4,500,000. Untuk tujuan ini, mereka telah berbincang dengan Global Finance. Mereka bersetuju membayar RM500,000 sebagai bayaran pendahuluan. Faedah dikenakan pada kadar 5% setahun. Bayaran lain yang perlu dijelaskan termasuk RM50,000 untuk yuran guaman dan RM800,000 untuk insurans. Puan Amni bersetuju membayar rumah tersebut untuk tempoh 30 tahun.

You are required to calculate:
Anda dikehendaki mengira:

i. total loan.
jumlah pinjaman.

[3 marks]
[*3 markah*]

ii. total interest charge.
jumlah faedah yang dikenakan.

[3 marks]
[*3 markah*]

iii. monthly payment.
bayaran bulanan.

[3 marks]
[*3 markah*]

iv. If Mrs Amni wants to pay her debt after 250th payment, how much is the early settlement amount?
Jika Pn Amni ingin melangsaikan pinjamannya selepas pembayaran kali ke 250, berapakah jumlah penyelesaian awal?

[6 marks]
[*6 markah*]

QUESTION 4
SOALAN 4

a) Rimba Trading is considering an investment on either AT10 Machine or MM20 Machine. Both machines require an initial outlay of RM350,000. Below is the expected cash flow after tax for the machines:

Rimba Trading sedang mempertimbangkan pelaburan sama ada Mesin AT10 atau Mesin MM20. Kedua-dua mesin memerlukan kos permulaan sebanyak RM350 000. Di bawah adalah jangkaan alir tunai selepas cukai untuk mesin:

	YEAR	**1**	**2**	**3**	**4**
Cash Inflow (RM)	AT10 Machine	120,000	120,000	120,000	120,000
	MM20 Machine	98,000	115,000	160,000	110,000

The cost of capital for both machines is 10%.
Kos modal bagi kedua-dua mesin ialah 10%.

CLO2

You are required to:
Anda dikehendaki untuk:

i. count the net present value for both machines.
mengira nilai kini bersih bagi kedua-dua mesin.

[9 marks]
[*9 markah*]

ii. identify the best alternative.
mengenalpasti pilihan terbaik.

[1 mark]
[*1 markah*]

CLO2 b) Amney Corporation, manufacturer of health products just received orders from its four (4) regular customers A1, A2, A3 and A4. Amney has four (4) warehouses, WI, WII, WIII and WIV where each warehouse could supply the products to any one of the customers. To deliver the orders, Amney has appointed a delivery company. The transportation cost (in RM) per box are as follow:

Amney Corporation merupakan pengeluar produk kesihatan. Ia telah menerima tempahan dari empat (4) pelanggan tetapnya, A1, A2, A3 dan A4. Amney mempunyai empat (4) gudang iaitu WI, WII, WIII dan WIV yang mana ia boleh membekalkan produk kepada mana-mana pelanggan. Bagi tujuan penghantaran tersebut, Amney telah melantik sebuah syarikat penghantaran. Kos pengangkutan (RM) sekotak adalah seperti di bawah:

To *Kepada* / From *Dari*	A1	A2	A3	A4
WI	4	6	9	6
WII	2	4	6	4
WIII	5	3	7	5
WIV	6	5	6	6

The total orders from customers A1 is 300 boxes, A2 is 240 boxes, A3 is 310 boxes and A4 is 350 boxes respectively. The number of boxes available at WI is 400 boxes, WII is 260 boxes, WIII is 280 boxes and WIV is 260 boxes.

Jumlah pesanan dari pelanggan A1 adalah 300 kotak, A2 adalah 240 kotak, A3 adalah 310 kotak dan A4 adalah 350 kotak masing-masing. Bilangan kotak yang terdapat di W1 adalah 400 kotak, W11 adalah 260 kotak, W111 adalah 280 kotak dan WIV adalah 260 kotak.

Based on the above information, you are required to:
Berdasarkan maklumat di atas, anda dikehendaki:

Visualize the transportation matrix based on the above data.
Visualisasikan matrik pengangkutan berdasarkan data di atas.

[5 marks]
[*5 markah*]

CLO2 c) Based on the answer in (b), calculate the transportation cost by using the Northwest Corner Method.

Berdasarkan jawapan di (b), kirakan kos pengangkutan dengan menggunakan Kaedah Pepenjuru Barat Laut.

[10 marks]
[*10 markah*]

SOALAN TAMAT

Table A-4 Present Value Interest Factors for a One-Dollar Annuity Discounted at k Percent for n Periods: PVIFA = $[1 - 1/(1 + k)^n] / k$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8065	0.8000	0.7692
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.7125	1.6901	1.6681	1.6467	1.6257	1.6052	1.5278	1.4568	1.4400	1.3609
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4437	2.4018	2.3612	2.3216	2.2832	2.2459	2.1065	1.9813	1.9520	1.8161
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.1024	3.0373	2.9745	2.9137	2.8550	2.7982	2.5887	2.4043	2.3616	2.1662
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6959	3.6048	3.5172	3.4331	3.3522	3.2743	2.9906	2.7454	2.6893	2.4356
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.2305	4.1114	3.9975	3.8887	3.7845	3.6847	3.3255	3.0205	2.9514	2.6427
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.7122	4.5638	4.4226	4.2883	4.1604	4.0386	3.6046	3.2423	3.1611	2.8021
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	5.1461	4.9676	4.7988	4.6389	4.4873	4.3436	3.8372	3.4212	3.3289	2.9247
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.5370	5.3282	5.1317	4.9464	4.7716	4.6065	4.0310	3.5655	3.4631	3.0190
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.8892	5.6502	5.4262	5.2161	5.0188	4.8332	4.1925	3.6819	3.5705	3.0915
11	10.368	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	6.2065	5.9377	5.6869	5.4527	5.2337	5.0286	4.3271	3.7757	3.6564	3.1473
12	11.255	10.575	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.4924	6.1944	5.9176	5.6603	5.4206	5.1971	4.4392	3.8514	3.7251	3.1903
13	12.134	11.348	10.635	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.7499	6.4235	6.1218	5.8424	5.5831	5.3423	4.5327	3.9124	3.7801	3.2233
14	13.004	12.106	11.296	10.563	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.9819	6.6282	6.3025	6.0021	5.7245	5.4675	4.6106	3.9616	3.8241	3.2487
15	13.865	12.849	11.938	11.118	10.380	9.7122	9.1079	8.5595	8.0607	7.6061	7.1909	6.8109	6.4624	6.1422	5.8474	5.5755	4.6755	4.0013	3.8593	3.2682
16	14.718	13.578	12.561	11.652	10.838	10.106	9.4466	8.8514	8.3126	7.8237	7.3792	6.9740	6.6039	6.2651	5.9542	5.6685	4.7296	4.0333	3.8874	3.2832
17	15.562	14.292	13.166	12.166	11.274	10.477	9.7632	9.1216	8.5436	8.0216	7.5488	7.1196	6.7291	6.3729	6.0472	5.7487	4.7746	4.0591	3.9099	3.2948
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.3719	8.7556	8.2014	7.7016	7.2497	6.8399	6.4674	6.1280	5.8178	4.8122	4.0799	3.9279	3.3037
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.6036	8.9501	8.3649	7.8393	7.3658	6.9380	6.5504	6.1982	5.8775	4.8435	4.0967	3.9424	3.3105
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.8181	9.1285	8.5136	7.9633	7.4694	7.0248	6.6231	6.2593	5.9288	4.8696	4.1103	3.9539	3.3158
21	18.857	17.011	15.415	14.029	12.821	11.764	10.836	10.017	9.2922	8.6487	8.0751	7.5620	7.1016	6.6870	6.3125	5.9731	4.8913	4.1212	3.9631	3.3198
22	19.660	17.658	15.937	14.451	13.163	12.042	11.061	10.201	9.4424	8.7715	8.1757	7.6446	7.1695	6.7429	6.3587	6.0113	4.9094	4.1300	3.9705	3.3230
23	20.456	18.292	16.444	14.857	13.489	12.303	11.272	10.371	9.5802	8.8832	8.2664	7.7184	7.2297	6.7921	6.3988	6.0442	4.9245	4.1371	3.9764	3.3254
24	21.243	18.914	16.936	15.247	13.799	12.550	11.469	10.529	9.7066	8.9847	8.3481	7.7843	7.2829	6.8351	6.4338	6.0726	4.9371	4.1428	3.9811	3.3272
25	22.023	19.523	17.413	15.622	14.094	12.783	11.654	10.675	9.8226	9.0770	8.4217	7.8431	7.3300	6.8729	6.4641	6.0971	4.9476	4.1474	3.9849	3.3286
30	25.808	22.396	19.600	17.292	15.372	13.765	12.409	11.258	10.274	9.4269	8.6938	8.0552	7.4957	7.0027	6.5660	6.1772	4.9789	4.1601	3.9950	3.3321
35	29.409	24.999	21.487	18.665	16.374	14.498	12.948	11.655	10.567	9.6442	8.8552	8.1755	7.5856	7.0700	6.6166	6.2153	4.9915	4.1644	3.9984	3.3330
36	30.108	25.489	21.832	18.908	16.547	14.621	13.035	11.717	10.612	9.6765	8.8786	8.1924	7.5979	7.0790	6.6231	6.2201	4.9929	4.1649	3.9987	3.3331
40	32.835	27.355	23.115	19.793	17.159	15.046	13.332	11.925	10.757	9.7791	8.9511	8.2438	7.6344	7.1050	6.6418	6.2335	4.9966	4.1659	3.9995	3.3332
50	39.196	31.424	25.730	21.482	18.256	15.762	13.801	12.233	10.962	9.9148	9.0417	8.3045	7.6752	7.1327	6.6605	6.2463	4.9995	4.1666	3.9999	3.3333

Table A-3 Present Value Interest Factors for One Dollar Discounted at k Percent for n Periods: $PVIF_{k,n} = 1 / (1 + k)^n$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8065	0.8000	0.7692
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264	0.8116	0.7972	0.7831	0.7695	0.7561	0.7432	0.6944	0.6504	0.6400	0.5917
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513	0.7312	0.7118	0.6931	0.6750	0.6575	0.6407	0.5787	0.5245	0.5120	0.4552
4	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6587	0.6355	0.6133	0.5921	0.5718	0.5523	0.4823	0.4230	0.4096	0.3501
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5935	0.5674	0.5428	0.5194	0.4972	0.4761	0.4019	0.3411	0.3277	0.2693
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5346	0.5066	0.4803	0.4556	0.4323	0.4104	0.3349	0.2751	0.2621	0.2072
7	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4817	0.4523	0.4251	0.3996	0.3759	0.3538	0.2791	0.2218	0.2097	0.1594
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665	0.4339	0.4039	0.3762	0.3506	0.3269	0.3050	0.2326	0.1789	0.1678	0.1226
9	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241	0.3909	0.3606	0.3329	0.3075	0.2843	0.2630	0.1938	0.1443	0.1342	0.0943
10	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632	0.4224	0.3855	0.3522	0.3220	0.2946	0.2697	0.2472	0.2267	0.1615	0.1164	0.1074	0.0725
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505	0.3173	0.2875	0.2607	0.2366	0.2149	0.1954	0.1346	0.0938	0.0859	0.0558
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555	0.3186	0.2858	0.2567	0.2307	0.2076	0.1869	0.1685	0.1122	0.0757	0.0687	0.0429
13	0.8787	0.7730	0.6810	0.6006	0.5303	0.4688	0.4150	0.3677	0.3262	0.2897	0.2575	0.2292	0.2042	0.1821	0.1625	0.1452	0.0935	0.0610	0.0550	0.0330
14	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992	0.2633	0.2320	0.2046	0.1807	0.1597	0.1413	0.1252	0.0779	0.0492	0.0440	0.0254
15	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745	0.2394	0.2090	0.1827	0.1599	0.1401	0.1229	0.1079	0.0649	0.0397	0.0352	0.0195
16	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919	0.2519	0.2176	0.1883	0.1631	0.1415	0.1229	0.1069	0.0930	0.0541	0.0320	0.0281	0.0150
17	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703	0.2311	0.1978	0.1696	0.1456	0.1252	0.1078	0.0929	0.0802	0.0451	0.0258	0.0225	0.0116
18	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2959	0.2502	0.2120	0.1799	0.1528	0.1300	0.1108	0.0946	0.0808	0.0691	0.0376	0.0208	0.0180	0.0089
19	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1161	0.0981	0.0829	0.0703	0.0596	0.0313	0.0168	0.0144	0.0068
20	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145	0.1784	0.1486	0.1240	0.1037	0.0868	0.0728	0.0611	0.0514	0.0261	0.0135	0.0115	0.0053
21	0.8114	0.6598	0.5375	0.4388	0.3589	0.2942	0.2415	0.1987	0.1637	0.1351	0.1117	0.0926	0.0768	0.0638	0.0531	0.0443	0.0217	0.0109	0.0092	0.0040
22	0.8034	0.6468	0.5219	0.4220	0.3418	0.2775	0.2257	0.1839	0.1502	0.1228	0.1007	0.0826	0.0680	0.0560	0.0462	0.0382	0.0181	0.0088	0.0074	0.0031
23	0.7954	0.6342	0.5067	0.4057	0.3256	0.2618	0.2109	0.1703	0.1378	0.1117	0.0907	0.0738	0.0601	0.0491	0.0402	0.0329	0.0151	0.0071	0.0059	0.0024
24	0.7876	0.6217	0.4919	0.3901	0.3101	0.2470	0.1971	0.1577	0.1264	0.1015	0.0817	0.0659	0.0532	0.0431	0.0349	0.0284	0.0126	0.0057	0.0047	0.0018
25	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1160	0.0923	0.0736	0.0588	0.0471	0.0378	0.0304	0.0245	0.0105	0.0046	0.0038	0.0014
30	0.7419	0.5521	0.4120	0.3083	0.2314	0.1741	0.1314	0.0994	0.0754	0.0573	0.0437	0.0334	0.0256	0.0196	0.0151	0.0116	0.0042	0.0016	0.0012	*
35	0.7059	0.5000	0.3554	0.2534	0.1813	0.1301	0.0937	0.0676	0.0490	0.0356	0.0259	0.0189	0.0139	0.0102	0.0075	0.0055	0.0017	0.0005	*	*
36	0.6989	0.4902	0.3450	0.2437	0.1727	0.1227	0.0875	0.0626	0.0449	0.0323	0.0234	0.0169	0.0123	0.0089	0.0065	0.0048	0.0014	*	*	*
40	0.6717	0.4529	0.3066	0.2083	0.1420	0.0972	0.0668	0.0460	0.0318	0.0221	0.0154	0.0107	0.0075	0.0053	0.0037	0.0026	0.0007	*	*	*
50	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0339	0.0213	0.0134	0.0085	0.0054	0.0035	0.0022	0.0014	0.0009	0.0006	*	*	*	*

FORMULA BUSINESS MATHEMATICS

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$P = pQ - VCQ - FC$$

$$P = TR - TC$$

$$TC = VCQ + FC$$

$$TR = pQ$$

$$TVC = VCQ$$

$$BEP(Q) = \frac{FC}{p - VC}$$

$$BEP(RM) = BEP(Q)\ x\ \ p$$

$$CM = p - VC$$

$$CMR = \frac{p - VC}{p}\ x\ 100$$

$$\frac{dy}{dx} = nx^{n-1}$$

$$\frac{dy}{dx} = nx^{n-1} + 0$$

$$\frac{dy}{dx} = anx^{n-1}$$

$$\frac{dy}{dx} = anx^{n-1} + bmx^{m-1}$$

$$\frac{dy}{dx} = u\frac{dv}{dx} + v\frac{du}{dx}$$

$$\frac{dy}{dx} = \frac{v\frac{du}{dx} - u\frac{dv}{dx}}{v^2}$$

$$\frac{dy}{dx} = \frac{dy}{du}\ x\ \frac{du}{dx}$$

$$I = Prt$$

$$I = IP - CP$$

$$I = \left(\frac{Pr + Yr}{2}\right)t \quad or \quad I = \frac{\Pr(t+1)}{2}$$

$$Y = \frac{P}{t}$$

$$DP = Rate\ (\%)\ x\ CP$$

$$P = CP - DP + other\ payments$$

$$S = P + I$$

$$S = P(1 + rt)$$

$$D = Sdt$$

$$H = S - D$$

$$MP = \frac{S}{n}$$

$$IP = DP + (MP\ x\ n)\ @\ DP + S\ @\ DP + P + I$$

$$R = \frac{\sum n}{\sum N}\ x\ I \quad and \quad \sum n = (\frac{n+1}{2})n\,, \quad \sum N = (\frac{N+1}{2})N$$

$$EP = (n\ x\ MP) - R$$

$$S = P(1 + \frac{i}{m})^{n.m}$$

$$P = \frac{S}{(1 + \frac{i}{m})^{n.m}}$$

$$P = R\left(\frac{1 - \left(1 + \frac{i}{m}\right)^{-n.m}}{\frac{i}{m}}\right) \quad and \quad R = \frac{P(\frac{i}{m})}{1 - (1 + \frac{i}{m})^{-n.m}}$$

$$S = R\left(\frac{\left(1 + \frac{i}{m}\right)^{n.m} - 1}{\frac{i}{m}}\right) \quad and \quad R = \frac{S(\frac{i}{m})}{(1 + \frac{i}{m})^{n.m} - 1}$$

$$PP = \frac{IO}{ACF}$$

$$PP = T + \frac{IO - \sum CF_T}{CF_{T+1}}$$

$$ARR = \frac{Average\ CF - Dep.}{IO}\ x\ 100$$

$$NPV = ACF(PVIFA, k\%, n) - IO$$

$$PI = \frac{TPV}{IO}$$