
UNIVERSITI SAINS MALAYSIA

Second Semester Examination
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APRIL 2008

EPM 102/2 – ENGINEERING ECONOMY
EKONOMI KEJURUTERAAN

Duration: 2 hours
Masa: 2 jam

ARAHAN KEPADA CALON :

Please check that this paper contains **NINE** (9) printed pages, **THREE** (3) pages appendix and **SIX** (6) questions before you begin the examination.
Sila pastikan bahawa kertas soalan ini mengandungi SEMBILAN (9) mukasurat, TIGA (3) mukasurat lampiran dan ENAM (6) soalan yang bercetak sebelum anda memulakan peperiksaan.

Please answer **FOUR** (4) questions only, answer **TWO** (2) questions from **PART A** and **TWO** (2) questions from **PART B**.
Sila jawab EMPAT (4) soalan sahaja iaitu jawab DUA (2) soalan daripada BAHAGIAN A dan DUA (2) soalan daripada BAHAGIAN B.

Answer all questions in **English** OR **Bahasa Malaysia** OR a combination of both.
Pelajar dibenarkan menjawab semua soalan dalam Bahasa Inggeris ATAU Bahasa Malaysia ATAU kombinasi kedua-duanya.

Appendix/Lampiran:

- | | |
|---|--------------------|
| 1. Lampiran 1: MACRS Class Lives and Recovery Periods | [1 page/mukasurat] |
| 2. Lampiran 2: Discrete Compounding; $i = 10\%$ | [1 page/mukasurat] |
| 3. Lampiran 3: Discrete Compounding; $i = 15\%$ | [1 page/mukasurat] |

Each answer must begin from a new page.
Setiap jawapan mestilah dimulakan pada mukasurat yang baru.

BAHAGIAN A

- Q1. [a]** A postal service carrier works on Sunday delivering special high-priority letters. She can deliver 15 letters per hour. The hourly fixed costs equal RM42, and the hourly variable costs is RM0.50 per letter. How much must the postal service charge for each letter delivered in order to break even on Sunday deliveries?

Seorang pekerja perkhidmatan pos berkerja pada hari Ahad menghantar surat khas. Dia menghantar 15 surat dalam satu jam. Kos tetap satu jam adalah RM42, dan kos perubahan ialah RM0.50 satu surat. Berapakah yang sepatutnya harga minima bagi setiap surat yang dihantar pada hari Ahad supaya dapat membiayai semua kos.

(10 marks/markah)

- [b]** An integrated approach to develop a net cash flow for a feasible project alternative contains three basic components. Please elaborate each component.

Langkah-langkah bersepadu dalam membangun aliran tunai satu projek alternatif mempunyai tiga komponen asas. Sila huraikan setiap komponen berkenaan.

(30 marks/markah)

- [c]** A company wishes to build a warehouse with a space of 500,000 m² in Parit Buntar to cater for its northern Malaysia logistic services, with the following information:

- The KL warehouse with the space of 2,500,000 m² has cost the company RM 4.5 mil to build 10 years ago, with approximate cost index of 350. The cost index at the moment is estimated at 730. The cost capacity factor is set as 0.34.
- 35 staffs have to be employed, with total labour cost of RM 2 mil per year.
- The company brings goods from Penang port to the warehouse and distributes them from warehouse to customer around the regions. The staffs still have to familiar themselves with the routes in northern Malaysia. Initially their annual travelling distance is 100,000,000 km, with some traveling wasted in finding the location. It is estimated their improvement rate is around 0.80 per year. The fuel cost per km is RM0.60 (with an increase of 10% every year).
- The maintenance cost is estimated at RM 500,000 per year, but increase 20% every two years.
- The revenue received will be RM74.5 mil per year.

Calculate the following:

- i) The building cost of the Parit Buntar warehouse.
- ii) The total distance travel for the first five years.
- iii) DRAW a cash flow diagram showing the cash flow for the company for THE FIRST THREE YEARS.

Jika satu syarikat ingin membina sebuah gudang yang seluas 500,000 m² di Parit Buntar untuk memenuhi keperluan perkhidmatan logistik di utara Malaysia. Maklumat mengenai cadangan tersebut adalah seperti berikut.

- *Gudang di KL yang sedia ada mempunyai keluasan 2,500,000 m² dan kos binaan ialah RM4.5 juta 10 tahun yang lalu, dengan kos indeks 350. Kos index masa kini dijangka pada 730. Faktor kos kapasiti ialah 0.34.*
- *35 staf telah diupah, dan jumlah gaji setahun ialah RM 2 juta.*
- *Syarikat tersebut menghantar barang-barang dari perlabuhan Pulau Pinang ke gudang dan mengagihkan barang-barang berkenaan dari gudang kepada pelanggan-pelanggan yang berlokasi di utara Malaysia. Staf masih perlu membiasakan diri mereka dengan perjalanan di Utara Malaysia. Dijangkakan dalam tahun pertama, jumlah jarak perjalanan ialah 100,000,000 km, yang diantaranya terdapat baziran disebabkan kesesakan lalulintas. Dijangkakan kadar penambahbaikan adalah 0.80 setahun. Kos petrol satu km ialah RM0.60 (yang akan meningkat 10% setahun).*
- *Kos penyelenggaraan bernilai RM500,000 setahun, dengan peningkatan sebanyak 20% setiap tempoh dua tahun.*
- *Pendapatan yang akan diterima ialah RM74.5 juta setahun.*

Kirakan

- i) Kos gudang yang akan dibina di Parit Buntar.*
- ii) Jumlah jarak perjalanan dalam lima tahun pertama.*
- iii) BINAKAN satu rajah aliran tunai untuk menunjukkan aliran tunai syarikat tersebut hanya pada TIGA TAHUN YANG PERTAMA.*

(60 marks/markah)

Q2. [a] Calculate the effective interest rate:

- i) 12% apr compounded semiannually**
- ii) 0.98% monthly interest**

Kirakan kadar faedah efektif berikut:

- i) 12% apr kompaun setengah tahun*
- ii) 0.98% kadar faedah bulanan.*

(10 marks/markah)

[b] Madam Lim starts working at 25 years old. She would like to know how much money will she be getting from her KWSP saving account after retirement at age of 55. Assume her salary is RM 5,000 per month and remains unchanged till she retires. The KWSP dictates that 11% of the salary is to be entered into the KWSP saving account, and the employer has to contribute another 12% of the salary. Let say the interest rate paid out by KWSP is about 6% per annum.

- i) How much she will be getting at the age of 55 if she plans to redraw the money in a lump-sum.
- ii) If at the age of 55, she plans to transfer all the KWSP savings in an investment plan where she will be receiving B money for the next 40 years, at the interest rate promised to be 15% per year compounded semi-annually. What the value B be ?

Puan Lim mula berkerja pada umur 25 tahun. Beliau ingin tahu jumlah wang yang akan diterima dari akaun simpanan KWSPnya semasa bersara pada umur 55. Pendapatan beliau ialah RM5,000 sebulan dan tidak berubah sehingga beliau bersara. KWSP mengatakan 11% dari pendapatannya akan dimasukkan ke dalam akaun simpanan KWSP, dan majikan juga perlu menyumbangkan lagi 12% pendapatan pekerja tersebut ke dalam akaun simpanan KWSP itu. Kadar faedah yang diberi oleh KWSP atas akaun simpanan ialah 6% setahun.

- i) Berapakah jumlah yang akan diterima oleh beliau pada tahun 55 apabila beliau bersara.
- ii) Jika pada umur 55, beliau melaburkan semua simpanan di akaun simpanan KWSP ke satu skim pelaburan yang menjanjikan pulangan sebanyak B diterima setiap tahun selama 40 tahun seterusnya, pada kadar faedah 15% setahun kompaun setengah tahun. Tentukanlah nilai B .

(40 marks/markah)

- [c] A engineering proposal has been put forward to the company AX which promises the following cash flows table:

Cadangan kejuruteraan telah dihantar kepada Syarikat AX dengan jangkaan aliran-tunai seperti dalam jadual berikut:

ITEM	RM
Initial investment <i>Pelaburan awal</i>	12,000
Year 1 maintenance cost <i>Tahun 1 kos penyelenggaraan</i>	2,300
Year 1 revenue <i>Tahun 1 hasil</i>	9,000
Year 2 revenue <i>Tahun 2 hasil</i>	13,000
Year 3 revenue <i>Tahun 3 hasil</i>	2,000
Year 3 additional operating cost <i>Tahun 3 kos operasi tambahan</i>	5,000
Year 4 revenue <i>Tahun 4 hasil</i>	6,500
Year 5 Salvage value <i>Tahun 5 Nilai tinggalan</i>	4,000

Table Q2[c]
Jadual S2[c]

Company AX requires 15% of MARR.

- i) Use FW and Discount payback method to analyze the proposal.**
- ii) Discuss your results of the proposal.**

Syarikat AX memerlukan 15% MARR.

- i) Guna kaedah FW dan kaedah bayaran balik potongan untuk menganalisa cadangan tersebut.*
- ii) Berikan kesimpulan berdasarkan keputusan yang diperolehi.*

(50 marks/markah)

- Q3. [a] There are seven principles of engineering economy. Please explain the following three: (i) Focus on the differences, (ii) Use a consistent viewpoint as well as (iii) Make uncertainty explicit, in particular why these three principles are important for engineering economic study.**

Terdapatnya tujuh prinsip utama dalam ekonomi kejuruteraan. Jelaskan tiga prinsip iaitu (i) tumpu kepada perbezaan, (ii) guna pandangan yang konsisten (iii) jelaskan sebarang ketidakpastian, terutamanya kenapa tiga prinsip tersebut adalah penting dalam kajian kejuruteraan ekonomi.

(40 marks/markah)

- [b] A company has allocated RM 5 million for the next year investment. However, it has not decided what the MARR to be imposed on the investment. 3 projects have been proposed for next year, namely A, B and C where each requires equal amount of capital investment, that is RM 2.5 million. It is revealed that the project A and B each gives interest rate of 24% and 26% respectively, while the project C is yet to be determined. The information of Project C is given below:**

Project C

Initial investment of RM 2.5 mil. The project duration is for 5 years, with each year bringing in revenue of RM 1.27 mil. There is an additional machinery to be bought at the end of year 3 at the cost RM 950 K. Operating cost per year is RM 100 K for the first 3 years, however, the subsequent two years it will increase to RM 200 K.

Satu syarikat telah memperuntuk sebanyak RM 5 juta untuk pelaburan pada tahun hadapan. Namun, kadar faedah minima tarikan belum ditetapkan. Setakat ini, tiga projek A, B dan C telah dicadangan. Setiap projek memerlukan pelaburan sejumlah RM 2.5 juta. Projek A dan B dijangka memperoleh kadar faedah sebanyak 24% and 26% tetapi Projek C belum ditentukan lagi kadar faedahnya. Maklumat mengenai Projek C diberi seperti di bawah.

Projek C

Pelaburan permulaan adalah sebanyak RM 2.5 juta. Tempoh projek ini ialah lima tahun. Setiap tahun pulangan yang dihasilkan adalah sebanyak RM 1.27 juta. Mesin tambahan perlu dibeli pada hujung tahun ketiga pada harga RM 950 ribu. Kos operasi adalah RM 100 ribu setahun selama tiga tahun pertama, dan seterusnya meningkat ke RM 200 ribu setahun untuk dua tahun yang terakhir.

i) Draw the cash flow diagram for project C

Lakarkan rajah aliran-tunai bagi projek C.

ii) Find out the interest rate associated with project C and determine the MARR.

Kirakan kadar faedah yang berkaitan dengan Projek C dan tentukan MARR yang patut syarikat itu amali.

iii) Calculate the ERR (external rate of return) of Project C if ϵ is given at 20%.

Kirakan ERR (kadar faedah pulangan luaran) bagi Projek C jika ϵ ialah 20%.

(60 marks/markah)

BAHAGIAN B

- Q4. A manufacturing company requires four additional forklift trucks to support a regional warehouse. The shutdown of this warehouse is anticipated in eight years. Two alternatives selected for details analysis, ABC and XYZ, are forklift models made by different manufacturers. Each model will provide a comparable level of service. The estimated information for each alternative is based on the requirement for four forklifts, as per Table Q4.**

Items		Model ABC	Model XYZ
Capital investment <i>Pelaburan Pokok</i>	(RM)	- 184,000	- 242,000
Annual expenses <i>Perbelanjaan Tahunan</i>	(RM)	- 30,000	- 26,700
Useful life <i>Jangka Hayat Berguna</i>	(years)	5	7
Market value at the end of useful life (RM) <i>Nilai Pasaran (MV) di akhir jangka hayat</i>		17,000	21,000

Table Q4
Jadual S4

The manager of the warehouse has instructed that an eight years study period to be used. The MARR for the company is 15% per year. It is estimated that future leasing of the forklifts of comparable capability from an equipment service company would have a total cost of RM104,000 per year (RM26,000 per forklift) based on a three-year lease. Under assumption that leasing would be used at the end of the useful life to provide a full eight years of comparable service. Determine :

Which model should be selected based on the Present Worth (PW) of the incremental cashflow. Confirm the selection based on the External Rate of Return (ERR) method of analysis (assume $\epsilon = \text{MARR} = 15.0\%$ per year).

Syarikat pembuatan memerlukan pertambahan empat foklif bagi membantu gudang wilayah. Gudang ini dijangkakan akan ditutup dalam lapan tahun. Dua alternatif dipilih bagi analisa terperinci, ABC dan XYZ, adalah model forklift yang dikeluarkan oleh syarikat pembuatan yang berbeza. Setiap model menyediakan perkhidmatan yang setara. Berdasarkan Jadual S4 satu anggaran setiap alternatif adalah berasaskan kepada keperluan empat foklif.

Pengurus gudang telah mengarahkan tempoh kajian adalah selama lapan tahun. MARR bagi syarikat adalah 15% setahun. Adalah dianggarkan pajakan dimasa hadapan bagi foklif yang mempunyai kemampuan yang setara daripada syarikat perkhidmatan peralatan dengan jumlah kos bernilai RM104,000 setahun (RM26,000 setiap foklif) berdasarkan tiga tahun pajakan. Jika andaian pajakan digunakan hingga akhir hayat berguna bagi menyediakan lapan tahun penuh perkhidmatan yang setara.

Tentukan :

Model yang wajar dipilih berdasarkan kepada Nilai Terkini (PW) aliran tunai yang bertambah. Pastikan pemilihan berdasarkan kepada analisa kaedah ERR (anggapkan $\epsilon = MARR = 15.0\%$ setahun).

(100 marks/markah)

Q5. [a] Explain how the cost basis of depreciable property is determined.

Jelaskan bagaimana menentukan asas kos bagi susut nilai harta.

(25 marks/markah)

[b] Petroleum production company bought an asset for drilling and placed it in service. Its cost basis is RM 60,000.00, and it has an estimated market value (MV) of RM 12,000.00 at the end of an estimated useful life of 14 years. Compute the depreciation amount in the third year and the book value (BV) at the end of the fifth year of life by using each method below :

- i) The straight - line (SL) method**
- ii) The 200% declining – balance (DB) method with switchover to straight line**
- iii) The general depreciation system (GDS). Please comment on the GDS recovery period**

Syarikat pengeluar petroleum telah membeli harta untuk pengerudian dan ditempatkan di dalam perkhidmatan. Harga kos asasnya ialah RM60,000.00, dan anggaran nilai pasaran (MV) bernilai RM12,000.00 pada anggaran akhir hayat berguna selama 14 tahun. Kirakan jumlah penyusutan bagi tahun ketiga dan BV pada akhir tahun kelima hayatnya dengan menggunakan setiap kaedah berikut :

- i) Kaedah garis lurus (SL)*
- i) Kaedah baki menurun (DB) bagi 200% dengan pertukaran kepada garis lurus.*
- ii) Sistem depresiasi am (GDB). Sila berikan komen tentang tempoh pemulihan GDS.*

(75 marks/markah)

- Q6. [a] Explain briefly the method to evaluate a project in private or in the public sector.

Terangkan dengan ringkas kaedah menilai sesuatu projek di sektor swasta atau di sektor awam.

(25 marks/markah)

- [b] A town maintenance department and waste-water department has a four-year-old sludge pump that was initially purchased for RM65,000.00. This pump can be kept in service for an additional four years, or it can be sold for RM35,000.00 and replaced by a new pump. The purchased price of the replacement pump is RM50,000.00. The projected market values (MV) and O&M costs over the four-year planning horizon are shown in Table Q6[b]. Assuming the MARR is 10.0%.

Determine:

- i) The economic life of the challenger (new option)
ii) When the defender (old option) should be replaced

Jabatan penyelenggaraan dan jabatan penyulingan-air bagi sekitar Bandar mempunyai pam lumpur berusia empat tahun yang telah dibeli dengan harga RM65,000.00. Pam ini boleh berfungsi selama empat tahun jika diselenggarakan, atau boleh dijual dengan harga RM35,000.00 dan digantikan dengan pam baru. Harga pembelian pam gantian ialah RM50,000.00. Jangkaan nilai pasaran (MV) dan kos O&M bagi perancangan mendatar selama empat tahun ditunjukkan seperti di dalam Jadual S6[b]. Anggapkan nilai MARR ialah 10.0%.

Tentukan :

- i) Bagi hayat ekonomi bagi "challenger" (pilihan baru)
ii) Bilakah "defender" (pilihan awal) sewajarnya diganti

Year Tahun	Defender (old option) Pilihan Awal		Challenger (new option) Pilihan Baru	
	MV at EOY (RM)	O & M Cost (RM)	MV at EOY (RM)	O & M Cost (RM)
1	25,000	18,500	40,000	13,000
2	21,000	21,000	32,000	15,500
3	17,000	23,500	24,000	18,000
4	13,000	26,000	16,000	20,500

Table Q6[b]
Jadual S6[b]

(75 marks/markah)

MACRS Class Lives and Recovery Periods^a**TABLE 7-2 MACRS Class Lives and Recovery Periods^a**

Asset Class	Description of Assets or Depreciable Assets Used in Business	Class Life	Recovery Period	
			GDS ^b	ADS
00.11	Office furniture and equipment	10	7	10
00.12	Information systems, including computers	6	5	5
00.22	Automobiles, taxis	3	5	5
00.23	Buses	9	5	9
00.241	Light general purpose trucks	4	5	5
00.242	Heavy general purpose trucks	6	5	6
00.26	Tractor units for use over the road	4	3	4
10.0	Mining	10	7	10
13.2	Production of petroleum and natural gas	14	7	14
13.3	Petroleum refining	16	10	16
15.0	Construction	6	5	6
22.3	Manufacture of carpets	9	5	9
24.4	Manufacture of wood products	10	7	10
28.0	Manufacture of chemicals and allied products	9.5	5	9.5
30.1	Manufacture of rubber products	14	7	14
32.2	Manufacture of cement	20	15	20
34.0	Manufacture of fabricated metal products	12	7	12
36.0	Manufacture of electronic components, products, and systems	6	5	6
37.11	Manufacture of motor vehicles	12	7	12
37.2	Manufacture of aerospace products	10	7	10
48.12	Telephone central office equipment	18	10	18
49.13	Electric utility steam production plant	28	20	28
49.21	Gas utility distribution facilities	35	20	35

^aPartial listing abstracted from *How to Depreciate Property*, IRS Publication 946, Tables B-1 and B-2, 1998.

^bAlso the GDS property class.

Discrete Compounding; $i = 10\%$

TABLE C-13 Discrete Compounding; $i = 10\%$

N	Single Payment		Uniform Series				Uniform Gradient		N
	Compound Amount Factor	Present Worth Factor	Compound Amount Factor	Present Worth Factor	Sinking Fund Factor	Capital Recovery Factor	Gradient Present Worth Factor	Gradient Uniform Series Factor	
	To Find F Given P F/P	To Find P Given F P/F	To Find F Given A F/A	To Find P Given A P/A	To Find A Given F A/F	To Find A Given P A/P	To Find P Given G P/G	To Find A Given G A/G	
1	1.1000	0.9091	1.0000	0.9091	1.0000	1.1000	0.000	0.0000	1
2	1.2100	0.8264	2.1000	1.7355	0.4762	0.5762	0.826	0.4762	2
3	1.3310	0.7513	3.3100	2.4869	0.3021	0.4021	2.329	0.9366	3
4	1.4641	0.6830	4.6410	3.1699	0.2155	0.3155	4.378	1.3812	4
5	1.6105	0.6209	6.1051	3.7908	0.1638	0.2638	6.862	1.8101	5
6	1.7716	0.5645	7.7156	4.3553	0.1296	0.2296	9.684	2.2236	6
7	1.9487	0.5132	9.4872	4.8684	0.1054	0.2054	12.763	2.6216	7
8	2.1436	0.4665	11.4359	5.3349	0.0874	0.1874	16.029	3.0045	8
9	2.3579	0.4241	13.5795	5.7590	0.0736	0.1736	19.422	3.3724	9
10	2.5937	0.3855	15.9374	6.1446	0.0627	0.1627	22.891	3.7255	10
11	2.8531	0.3505	18.5312	6.4951	0.0540	0.1540	26.396	4.0641	11
12	3.1384	0.3186	21.3843	6.8137	0.0468	0.1468	29.901	4.3884	12
13	3.4523	0.2897	24.5227	7.1034	0.0408	0.1408	33.377	4.6988	13
14	3.7975	0.2633	27.9750	7.3667	0.0357	0.1357	36.801	4.9955	14
15	4.1772	0.2394	31.7725	7.6061	0.0315	0.1315	40.152	5.2789	15
16	4.5950	0.2176	35.9497	7.8237	0.0278	0.1278	43.416	5.5493	16
17	5.0545	0.1978	40.5447	8.0216	0.0247	0.1247	46.582	5.8071	17
18	5.5599	0.1799	45.5992	8.2014	0.0219	0.1219	49.640	6.0526	18
19	6.1159	0.1635	51.1591	8.3649	0.0195	0.1195	52.583	6.2861	19
20	6.7275	0.1486	57.2750	8.5136	0.0175	0.1175	55.407	6.5081	20
21	7.4002	0.1351	64.0025	8.6487	0.0156	0.1156	58.110	6.7189	21
22	8.1403	0.1228	71.4027	8.7715	0.0140	0.1140	60.689	6.9189	22
23	8.9543	0.1117	79.5430	8.8832	0.0126	0.1126	63.146	7.1085	23
24	9.8497	0.1015	88.4973	8.9847	0.0113	0.1113	65.481	7.2881	24
25	10.8347	0.0923	98.3471	9.0770	0.0102	0.1102	67.696	7.4580	25
30	17.4494	0.0573	164.4940	9.4269	0.0061	0.1061	77.077	8.1762	30
35	28.1024	0.0356	271.0244	9.6442	0.0037	0.1037	83.987	8.7086	35
40	45.2593	0.0221	442.5926	9.7791	0.0023	0.1023	88.953	9.0962	40
45	72.8905	0.0137	718.9048	9.8628	0.0014	0.1014	92.454	9.3740	45
50	117.3909	0.0085	1163.9085	9.9148	0.0009	0.1009	94.889	9.5704	50
60	304.4816	0.0033	3034.8164	9.9672	0.0003	0.1003	97.701	9.8023	60
80	2048.4002	0.0005	20474.0021	9.9951	"	0.1000	99.561	9.9609	80
100	13780.6123	0.0001	137796.1234	9.9993	"	0.1000	99.920	9.9927	100
∞				10.0000		0.1000			∞

*Less than 0.0001

Discrete Compounding; $i = 15\%$

TABLE C-15 Discrete Compounding; $i = 15\%$									
Single Payment			Uniform Series				Uniform Gradient		
	Compound Amount Factor	Present Worth Factor	Compound Amount Factor	Present Worth Factor	Sinking Fund Factor	Capital Recovery Factor	Gradient Present Worth Factor	Gradient Uniform Series Factor	
N	To Find F Given P F/P	To Find P Given F P/F	To Find F Given A F/A	To Find P Given A P/A	To Find A Given F A/F	To Find A Given P A/P	To Find P Given G P/G	To Find A Given G A/G	N
1	1.1500	0.8696	1.0000	0.8696	1.0000	1.1500	0.000	0.0000	1
2	1.3225	0.7561	2.1500	1.6257	0.4651	0.6151	0.756	0.4651	2
3	1.5209	0.6575	3.4725	2.2832	0.2880	0.4380	2.071	0.9071	3
4	1.7490	0.5718	4.9934	2.8550	0.2003	0.3503	3.786	1.3263	4
5	2.0114	0.4972	6.7424	3.3522	0.1483	0.2983	5.775	1.7228	5
6	2.3131	0.4323	8.7537	3.7845	0.1142	0.2642	7.937	2.0972	6
7	2.6600	0.3759	11.0668	4.1604	0.0904	0.2404	10.192	2.4498	7
8	3.0590	0.3269	13.7268	4.4873	0.0729	0.2229	12.481	2.7813	8
9	3.5179	0.2843	16.7858	4.7716	0.0596	0.2096	14.755	3.0922	9
10	4.0456	0.2472	20.3037	5.0188	0.0493	0.1993	16.980	3.3832	10
11	4.6524	0.2149	24.3493	5.2337	0.0411	0.1911	19.129	3.6549	11
12	5.3503	0.1869	29.0017	5.4206	0.0345	0.1845	21.185	3.9082	12
13	6.1528	0.1625	34.3519	5.5831	0.0291	0.1791	23.135	4.1438	13
14	7.0757	0.1413	40.5047	5.7245	0.0247	0.1747	24.973	4.3624	14
15	8.1371	0.1229	47.5804	5.8474	0.0210	0.1710	26.693	4.5650	15
16	9.3576	0.1069	55.7175	5.9542	0.0179	0.1679	28.296	4.7522	16
17	10.7613	0.0929	65.0751	6.0472	0.0154	0.1654	29.783	4.9251	17
18	12.3755	0.0808	75.8364	6.1280	0.0132	0.1632	31.157	5.0843	18
19	14.2318	0.0703	88.2118	6.1982	0.0113	0.1613	32.421	5.2307	19
20	16.3665	0.0611	102.4436	6.2593	0.0098	0.1598	33.582	5.3651	20
21	18.8215	0.0531	118.8101	6.3125	0.0084	0.1584	34.645	5.4883	21
22	21.6447	0.0462	137.6316	6.3587	0.0073	0.1573	35.615	5.6010	22
23	24.8915	0.0402	159.2764	6.3988	0.0063	0.1563	36.499	5.7040	23
24	28.6252	0.0349	184.1678	6.4338	0.0054	0.1554	37.302	5.7979	24
25	32.9190	0.0304	212.7930	6.4641	0.0047	0.1547	38.031	5.8834	25
30	66.2118	0.0151	434.7451	6.5660	0.0023	0.1523	40.753	6.2066	30
35	133.1755	0.0075	881.1702	6.6166	0.0011	0.1511	42.359	6.4019	35
40	267.8635	0.0037	1779.0903	6.6418	0.0006	0.1506	43.283	6.5168	40
45	538.7693	0.0019	3585.1285	6.6543	0.0003	0.1503	43.805	6.5830	45
50	1083.6574	0.0009	7217.7163	6.6605	0.0001	0.1501	44.096	6.6205	50
60	4383.9987	0.0002	29219.9916	6.6651	"	0.1500	44.343	6.6530	60
80	71750.8794	"	478332.5293	6.6666	"	0.1500	44.436	6.6656	80
100	1174313.4507	"	7828749.6713	6.6667	"	0.1500	44.444	6.6666	100
∞				6.6667		0.1500			∞

*Less than 0.0001.