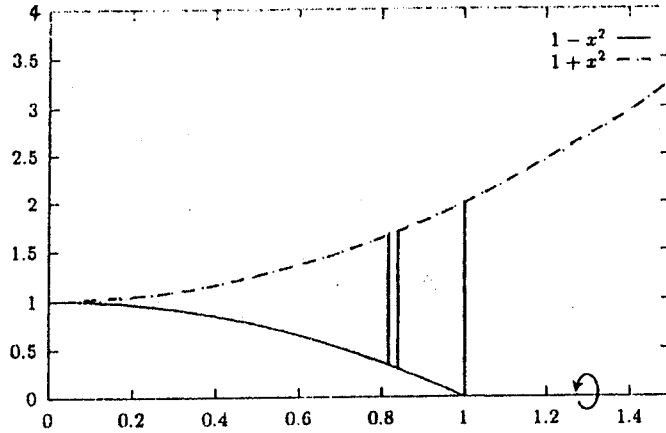


Revised:

Q1. Find the volumes of the solids obtained by rotating the region bounded by given curves about x-axis. $y=1-x^2, y=1+x^2, 0 \leq x \leq 1$ (10%)



私立臺北醫學院 九十學年度第一學期 期中考試 (試) 題紙

系級	科目	授課教師	考試日期	學號	姓名
公衛	微積分	潘力誠	81年 1 月 11 日第 節		

※①請注意本試題共 2 張。如發現頁數不足及空白頁或缺印，應當場請求補齊，否則缺少部份概以零分計。
 ②每張試題卷務必填寫(學號)、(姓名)。

Q1. Find the volumes of the solids obtained by rotating the region bounded by $y=1-x^2, y=1+x^2, 0 \leq x \leq 1$ (10%)

Q2. Determine the length of $f(x)=\frac{1}{4}x^2 - \frac{1}{2}\ln x$ from $x=1$ to $x=e$. (10%)

Q3. Evaluate $\int_0^1 2xe^{x^2} dx$ (10%)

Q4. Evaluate $\int_0^{\sqrt{7}} 7x^3\sqrt{1+x^2} dx$ (10%)

Q5. Given the number x in the following table is normally distributed. Find intervals such that 99% of the area is included and $P(x \in [-0.1, 0.1])$ (10%)

-1.633	0.542	0.250	-0.166	0.032
1.114	0.882	1.265	-0.202	0.151
1.151	-1.210	-0.927	0.425	0.290
-1.939	0.891	-0.227	0.602	0.873
0.385	-0.649	-0.577	0.237	-0.289

Q6. Give data points: 0.01, 0.01, 0.96, 0.17, 0.04, 0.26, 0.43, 0.25, 0.23, 0.68. Find the mean, standard deviation and 95% confidence intervals. (10%)

Q7. As test for the HIV virus shows a positive result in 99% of all cases when the virus is actually present, and in 5% of all cases when the virus is not present (a false positive result). If such a test is administered to a randomly chosen individual, what is the probability that the test result is positive? We assume that the prevalence of the virus in the population is 1/200. (10%)

Q8. What is the probability that the offspring of a $Cc \times Cc$ cross is of genotype cc ? (10%)

Q9. We consider the flowering pea plants again. Suppose that 20 independent offspring result from $Cc \times Cc$ crosses. Find the probability that at most two offspring have white flowers. Compute the expected value and the variance of the number of offspring with white flowers. (10%)

Q10. Suppose that you obtain 50 independent offspring from a cross

$$Rr / Yy \times Rr / Yy$$

where 25 seeds are round yellow, 9 are round green, 12 are wrinkled yellow, and 4 wrinkled green. Find the probability of this outcome. (10%)

私立臺北醫學院 九十學年度第一學期 ~~期中~~ 考試 (試) 命題紙

系級	科目	授課教師	考試日期	學號	姓名
公衛	微生物	潘力誠	____年____月____日第____節		

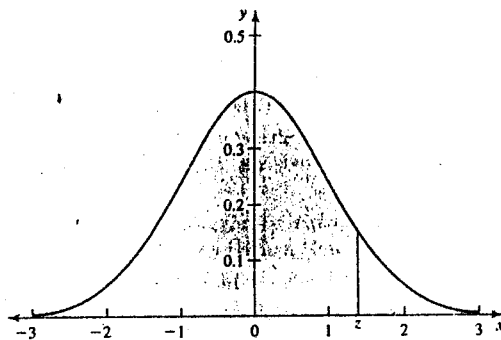
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 ②每張試題卷務必填寫(學號)、(姓名)。

Q11: To study food preferences in the lady beetle *Coleomegilla maculata*, we present each beetle with three different food choices: maize pollen, egg masses of the European corn borer and aphids. We suspect that 20% of the time the beetle prefers the aphids, 35% of the time egg masses, and 45% of the time pollen. We carry out this experiment with 30 beetles, and find that 8 beetles prefer aphids, 10 egg masses, and 12 pollen. Compute the probability of this event, assuming that the trials are independent. (10%)

Q12. Give 5 experital data points. (60,61) (63,63) (68,67) (70,72) (75,74) Find a linea regression model to represent those data and coefficient of determination r^2 . (10%)

◆ B TABLE OF THE STANDARD NORMAL DISTRIBUTION

Areas under the Standard Normal Curve from $-\infty$ to z (see Figure B.1).



◀ Figure B.1

z	0	1	2	3	4	5	6	7	8	9
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5754
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7258	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7518	.7549
0.7	.7580	.7612	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7996	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974