الفاينل كان قسمين

القسم الاول 2 + 1 Chapter

القسم الثاني 5 + 4 + 3 Chapter

فا مشان هيك رح تلقوهن قسمين, مع تحيات https://www.bzu-lib.com

Started on	Sunday, 24 January 2021, 2:00 PM
State	Finished
Completed on	Sunday, 24 January 2021, 3:15 PM
Time taken	1 hour 14 mins
Grade	**25.00** out of 30.00 (**83**%)

Question 1

Incorrect

Mark 0.00 out of 5.00

A certain computer becomes inoperable if two components A and B both fail. The probability that A fails is 0.01 and the probability that B fails is 0.04. However, the probability that B fails increases by a factor of 7 if A has failed.

Calculate the probability that computer A fails if B has failed. [0.7] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

❌

One possible correct answer is: 0.07

Your answer is incorrect.

Question 2

Correct

Mark 5.00 out of 5.00

A factory has two production lines **A** and **B**, production line **A** works 7 days a week, production line **B** works only 5 days a week. Production line **A** produces 5000 items each day where 93% of the produced items are high quality and the rest are of medium quality. Production line **B** produces 3500 items each day where 66% of the produced items are high quality, 12% medium quality, and the rest are of low quality. All items produced after working for many weeks are accumulated in a warehouse.

What is the probability that a high-quality item is produced? [0.84] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.84

Your answer is correct.

Question 3

Correct

Mark 5.00 out of 5.00

Let X be a random variable with a uniform distribution over the interval [-9 , 1].

Determine the mean of X. [-4] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: -4

Determine the standard deviation of X. [2.88℮] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 2.8867513459481

Your answer is correct.

A bus company knows that 6 percent of the people making reservations on a certain trip will not show up. Consequently, their policy is to sell 44 tickets for a trip that can hold only 42 passengers.

What is the probability that at least one passenger will be left unseated? 0.250 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.25025382918504

Your answer is correct.

Let X be a random variable that follows the normal distribution with zero mean and unity standard deviation.
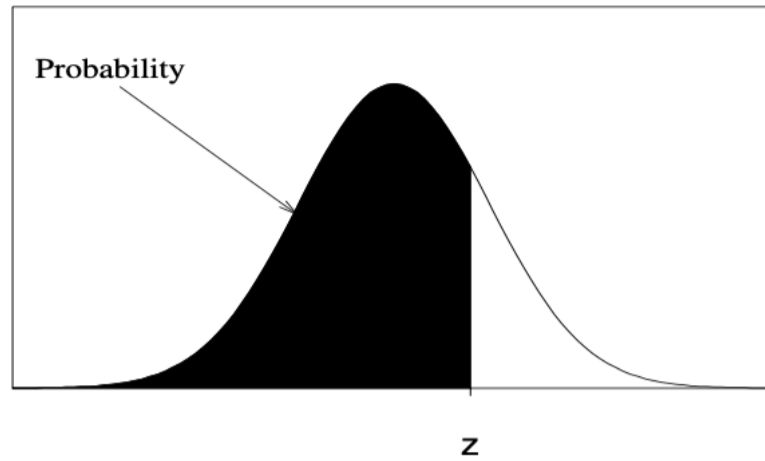
Probabilities for the standard normal distribution

Table entry for z is the
probability lying to the left of z

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998

Compute $P(X \leq 1.12)$. .868 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.86859089933526

Compute $P(X \geq 0.28)$. .389 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.38886779318394

Compute $P(X \leq -2.07)$. 0.019 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.019302220550924

Compute $P(X \geq -0.52)$. [.698!] [The answer should be a number rounded to five decimal places, don't use symbols such as %]

✔

One possible correct answer is: 0.69932485949491

Your answer is correct.

Let $f_X(x)$ be the probability density function of the random variable X.

$$f(x) = \begin{cases} \frac{2}{81} x & 0 \leq x \leq 9; \\ 0, & \text{otherwise.} \end{cases}$$

Compute $F_X(2.3)$ [0.06!] [The answer should be a number rounded to five decimal places, don't use symbols such as %]

✔

One possible correct answer is: 0.065308641975309

Your answer is correct.

Jump to...

Data retention summary

Started on	Sunday, 24 January 2021, 3:30 PM
State	Finished
Completed on	Sunday, 24 January 2021, 4:45 PM
Time taken	1 hour 14 mins
Grade	**26.67** out of 30.00 (**89**%)

Question 1

Correct

Mark 5.00 out of 5.00

The joint probability density function of two random variables X and Y is given by

$$f_{X,Y}(x,y) = \begin{cases} 3e^{-(3x+1y)} & 0 \le x, 0 \le y; \\ 0, & \text{otherwise.} \end{cases}$$

Note: $e^1 = 2.718281828$

Find the $P(X \le 0.1, Y \ge 1.6)$. [0.052] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.05232789877202

Find the $P(X \le 1.6, Y \le 0.2/Y \le 3)$. [0.189] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.18919701141437

Your answer is correct.

Question 2

Correct

Mark 5.00 out of 5.00

The joint probability density function of two random variables X and Y is given by

$$f_{X,Y}(x,y) = \begin{cases} K(1-x)(y), & 1 \le x \le 3, 0 \le y \le 1; \\ 0, & \text{otherwise.} \end{cases}$$

Determine the value of the constant K. [-1] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: -1

Your answer is correct.

Suppose that X and Y have the following joint probability distribution:

Joint Probability Mass Function of X and Y

	Y=1	Y=3	Y=5
X=1	0.06	0.09	0.06
X=2	0.14	0.14	0.51

Determine the mean of X (μ_X). {._0} *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

1.79 ✔

One possible correct answer is: 1.79

Determine the mean of Y (μ_Y). 3.75 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 3.74

Determine the standard deviation of X (σ_X). 0.165 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✘

One possible correct answer is: 0.40730823708833

Your answer is partially correct.

You have correctly answered 2 part(s) of this question.

An electronic company manufactures resistors that have a mean resistance of 139 Ω and a standard deviation of 13 Ω.
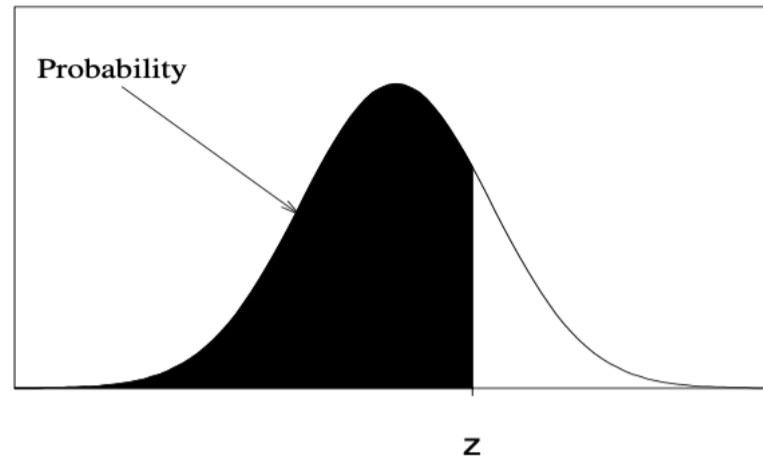
Probabilities for the standard normal distribution

Probability

Table entry for z is the probability lying to the left of z

z

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
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0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
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1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998

Find the probability that a random sample of n = 30 resistors will have an average resistance less than 137.7 Ω.

0.29 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.2972098773158

Your answer is correct.

Let X be a Gaussian random variable with mean μ = 4.5 and standard deviation σ = 2.5. A new random variable Y is defined as: Y = 2.2 X + 2.3.

Find the mean value of Y. 12.2 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 12.2

Find the standard deviation of Y. 5.5 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 5.5

Find the correlation coefficient between X and Y. 1.3 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✖

One possible correct answer is: 1.0

Your answer is partially correct.

You have correctly answered 2 part(s) of this question.

We take a sample of size 12 from a Gaussian population representing the service time at a gas station. The sample average is 6.2 minutes and the sample standard deviation is 1.8 minutes. Calculate the 90% confidence interval for the population mean
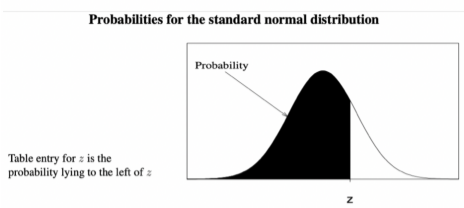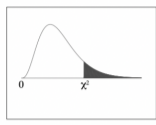

The lower end of the confidence interval is 5.258 [The answer should be a number rounded to five decimal places, don't use symbols such as %]

✔

One possible correct answer is: 5.2667710248819

The upper end of the confidence interval is 7.14 [The answer should be a number rounded to five decimal places, don't use symbols such as %]

✔

One possible correct answer is: 7.1332289751181

Your answer is correct.

◄ Final Exam-Part1- Sunday January 24, 2021 - Time: 14:00 - 15:15

Jump to...

Started on	Sunday, 24 January 2021, 2:00 PM
State	Finished
Completed on	Sunday, 24 January 2021, 3:14 PM
Time taken	1 hour 14 mins
Grade	**30.00** out of 30.00 (**100**%)

Question 1
Correct
Mark 5.00 out of 5.00

A box contains 9 non-defective (N) items and 2 defective (D) items. Three items are drawn without replacement.

Find the probability that exactly one defective item is obtained. 0.43 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.43636363636364

Your answer is correct.

Question 2
Correct
Mark 5.00 out of 5.00

A factory has two production lines **A** and **B**, production line **A** works 7 days a week, production line **B** works only 5 days a week. Production line **A** produces 5000 items each day where 81% of the produced items are high quality and the rest are of medium quality. Production line **B** produces 3500 items each day where 70% of the produced items are high quality, 15% medium quality, and the rest are of low quality. All items produced after working for many weeks are accumulated in a warehouse.

What is the probability that a medium quality item is produced? 0.17 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.17666666666667

Your answer is correct.

Question 3
Correct
Mark 5.00 out of 5.00

The lifetime X of a certain electronic component is an exponential random variable with a mean of 3 hours. Assuming 3 of these components operate independently in a device. The device operates if all components operate.

Find the probability that the lifetime of any electronic component is at least 4 hours. 0.263 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.26359713811573

Find the probability that the device operates for at least 4 hours. 0.018 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.018315638888734

Your answer is correct.

A bus company knows that 5 percent of the people making reservations on a certain trip will not show up. Consequently, their policy is to sell 46 tickets for a trip that can hold only 44 passengers.

What is the probability that at least one passenger will be left unseated? 0.323 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.32318083520805

Your answer is correct.

Let X be a random variable that follows the normal distribution with $\mu_X = -1$ and $\sigma_X^2 = 1$.
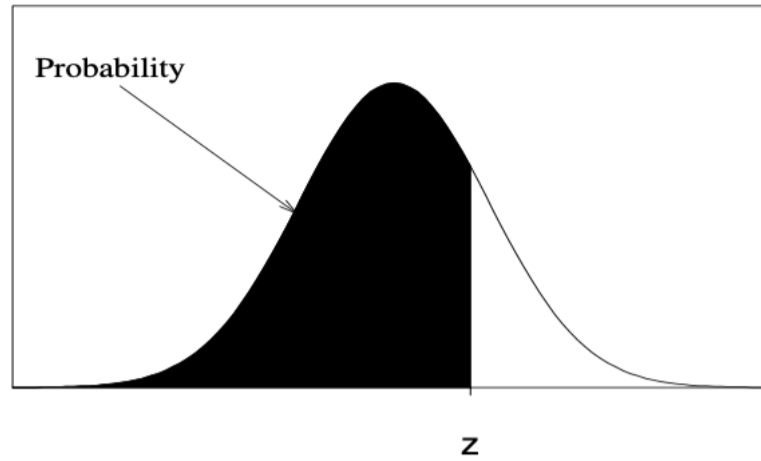
Probabilities for the standard normal distribution

Probability

Table entry for z is the probability lying to the left of z

z

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998

Compute $P(X \leq -0.73)$. 0.60€ *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.60727865662529

Compute $P(X \geq 1.09)$. 0.018 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.018378863906791

Compute $P(X \leq -3.41)$. 0.008 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.0079793555839112

Compute $P(X \geq -2.31)$. 0.90⁴ *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.90470424119703

Your answer is correct.

Let $f_X(x)$ be the probability density function of the random variable X.

$$f(x) = \begin{cases} \frac{3}{189}x^2 & -4 \leq x \leq 5; \\ 0, & \text{otherwise.} \end{cases}$$

Determine the $E\{X^2\}$. *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

13.1⁷ ✔

One possible correct answer is: 13.171428571429

Your answer is correct.

Started on	Sunday, 24 January 2021, 3:30 PM
State	Finished
Completed on	Sunday, 24 January 2021, 4:45 PM
Time taken	1 hour 14 mins
Grade	**30.00** out of 30.00 (**100**%)

Question 1

Correct

Mark 5.00 out of 5.00

The joint probability density function of two random variables X and Y is given by

$$f_{X,Y}(x,y) = \begin{cases} 2e^{-(2x+1y)} & 0 \le x, 0 \le y; \\ 0, & \text{otherwise.} \end{cases}$$

Note: $e^1 = 2.718281828$

Find the $P(X \le 1.5, Y \le 1.5)$. [0.738] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.73819176802195

Find the $P(X \le 0.6, Y \le 1.7/X \le 2.5)$. [0.575] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.57501993795684

Your answer is correct.

Question 2

Correct

Mark 5.00 out of 5.00

The joint probability density function of two random variables X and Y is given by

$$f_{X,Y}(x,y) = \begin{cases} Ke^{-(1x+1y)} & 0 \le x, 0 \le y; \\ 0, & \text{otherwise.} \end{cases}$$

Note: $e^1 = 2.718281828$

Determine the value of the constant K. [1] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 1

Your answer is correct.

Let X denote the number of times a certain numerical control machine will malfunction: 1, 2, or 3 times on any given day. Let Y denote the number of times a technician is called on an emergency call. Their joint probability distribution is given as

Joint Probability Mass Function of X and Y

	Y=1	Y=3	Y=5
X=1	0.09	0.02	0.09
X=2	0.07	0.01	0.01
X=3	0.08	0.04	0.59

Find the $P(X = 3)$. [0.71] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.71

Find the $P(X = 3/Y = 5)$. [0.85!] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.85507246376812

Find the $F_{X,Y}(3, 2)$. [0.24] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.24

Your answer is correct.

The heights of students are approximately normally distributed with a mean of 167 centimeters and a standard deviation of 12 centimeters. Suppose random samples of size 48 are drawn from this population and the sample means recorded to the nearest tenth of a centimeter.
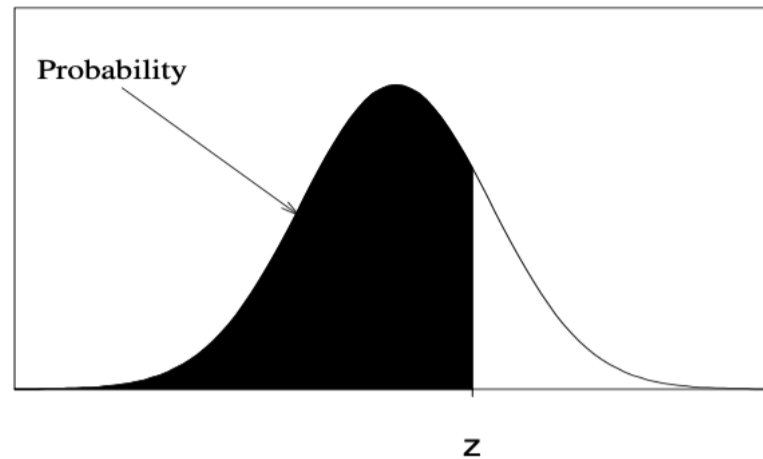
Probabilities for the standard normal distribution

Probability

Table entry for z is the
probability lying to the left of z

z

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998

Determine the probability that the sample mean ($\hat{\mu}$) is falling below 167.71 centimeters. 0.65 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.6600247494927

Your answer is correct.

Let X be a Gaussian random variable with mean μ = 4.2 and standard deviation σ = 2.9. A new random variable Y is defined as: Y = 3.7 X + 3.1.

Find the mean value of Y. `18.6` *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 18.64

Find the standard deviation of Y. `10.7` *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 10.73

Find the correlation coefficient between X and Y. `1` *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 1.0

Your answer is correct.

Suppose 230 randomly selected people are surveyed to determine if they own a tablet. Of the 230 surveyed, 92 reported owning a tablet. Using a 95% confidence level, compute a confidence interval estimate for the true proportion of people who own tablets.

The lower end of the confidence interval is 0.336 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.33668628831796

The upper end of the confidence interval is 0.463 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.46331371168204

Your answer is correct.

Started on	Sunday, 24 January 2021, 2:00 PM
State	Finished
Completed on	Sunday, 24 January 2021, 3:14 PM
Time taken	1 hour 14 mins
Grade	**30.00** out of 30.00 (**100**%)

Question 1

Correct

Mark 5.00 out of 5.00

Let A ,B and C be three disjoint events defined over the same place S. Assume $A \cup B \cup C = S$, $P(A) = 0.3$, and $P(B) = 0.4$.

1) Compute $P(C)$. 0.3   *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.3

2) Compute the $P(A \cup B)$. 0.7 . *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.7

Your answer is correct.

Question 2

Correct

Mark 5.00 out of 5.00

In the senior year of a high school graduating class of 74 students, 30 studied mathematics, 54 studied psychology, 42 studied history, 18 studied both mathematics and history, 17 studied both mathematics and psychology, 3 studied history but neither mathematics nor psychology, 6 studied all three subjects, and 4 did not take any of the three.

If a student who studied mathematics is selected, what is the probability that the student has also studied history? 0.6   *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.6

Your answer is correct.

The lifetime X of a certain electronic component is an exponential random variable with a mean of 3 hours. Assuming 3 of these components operate independently in a device. The device operates if at least two components operate.

Find the probability that the lifetime of any electronic component is at least 5 hours. 0.18 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.18887560283756

Find the probability that the device operates for at least 5 hours. 0.09 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.093546086043586

Your answer is correct.

A test consists of 9 MCQs (multiple choices questions) with every MCQ having its four options out of which only one is correct. A student passes the test if he answers 7 or more questions correctly.

If an unprepared student only guesses the correct answer out of the four possible choices, what is the probability that he passes the test? 0.00 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.0013427734375

Your answer is correct.

Let X be a random variable that follows the normal distribution with $\mu_X = 0.1$ and $\sigma_X^2 = 9$.
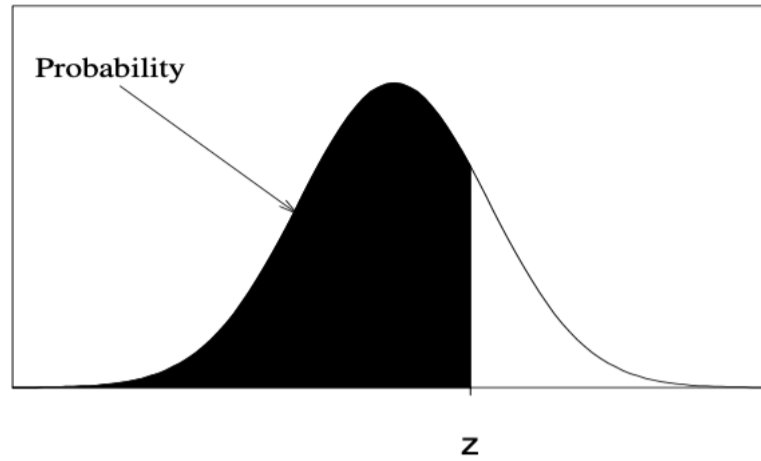
Probabilities for the standard normal distribution

Probability

Table entry for z is the
probability lying to the left of z

z

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998

Compute $P(X \leq 1.36)$. [0.662] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.66368243520011

Compute $P(X \geq 2.8)$. [0.184] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.18380624763342

Compute $P(X \leq -7.31)$. [0.000] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.0067524661537566

Compute $P(X \geq -7.04)$. 0.99 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.99133677101463

Your answer is correct.

Let $f_X(x)$ be the probability density function of the random variable X.

$$f(x) = \begin{cases} \frac{3}{152}x^2 & -3 \leq x \leq 5; \\ 0, & \text{otherwise.} \end{cases}$$

Determine the mean of X 2.684 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 2.6842105263158

Your answer is correct.

Data retention summary

Started on Sunday, 24 January 2021, 3:30 PM
State Finished
Completed on Sunday, 24 January 2021, 4:28 PM
Time taken 58 mins 16 secs
Grade **28.33** out of 30.00 (**94**%)

Question **1**

Correct

Mark 5.00 out of 5.00

The joint probability density function of two random variables X and Y is given by

$$f_{X,Y}(x,y) = \begin{cases} Kx(1-y), & 0 \le x \le 2, 1 \le y \le 2; \\ 0, & \text{otherwise.} \end{cases}$$

Determine the value of the constant K. | -1 | [The answer should be a number rounded to five decimal places, don't use symbols such as %]

✔

One possible correct answer is: -1

Your answer is correct.

Question **2**

Correct

Mark 5.00 out of 5.00

The joint probability density function of two random variables X and Y is given by

$$f_{X,Y}(x,y) = \begin{cases} 4e^{-(4x+1y)} & 0 \le x, 0 \le y; \\ 0, & \text{otherwise.} \end{cases}$$

Note: $e^1 = 2.718281828$

Find the $P(X \ge 0.4, Y \le 1.5)$. | 0.156 | [The answer should be a number rounded to five decimal places, don't use symbols such as %]

✔

One possible correct answer is: 0.1568473156011

Find the $P(X \le 0.3/Y = 1.7)$. | 0.698 | [The answer should be a number rounded to five decimal places, don't use symbols such as %]

✔

One possible correct answer is: 0.6988057880878

Your answer is correct.

Suppose that X and Y have the following joint probability distribution:

Joint Probability Mass Function of X and Y

	Y=1	Y=3	Y=5
X=1	0.07	0.12	0.11
X=2	0.1	0.06	0.54

Determine the mean of X (μ_X). {_0}   [The answer should be a number rounded to five decimal places, don't use symbols such as %]

1.7 ✔

One possible correct answer is: 1.7

Determine the mean of Y (μ_Y). 3.96   [The answer should be a number rounded to five decimal places, don't use symbols such as %]

✔

One possible correct answer is: 3.96

Determine the standard deviation of X (σ_X). 0.21   [The answer should be a number rounded to five decimal places, don't use symbols such as %]

✘

One possible correct answer is: 0.45825756949558

Your answer is partially correct.

You have correctly answered 2 part(s) of this question.

Question 4

Correct

Mark 5.00 out of 5.00

A bank teller serves customers standing in the queue one by one. Suppose that the service time X_i for customer i has mean $\mu_i = 4.1$ (minutes) and standard deviation $\sigma_i = 2.7$. We assume that service times for different bank customers are independent. Let Y be the average time the bank teller spends serving 32 customers.
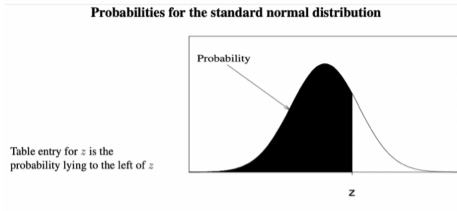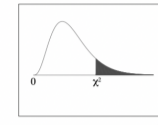
Find the standard deviation of Y. [0.477] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.47729707730092

Find P(Y ≥ 5.1) minutes. [0.017] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 0.018003595360826

Your answer is correct.

Question 5

Correct

Mark 5.00 out of 5.00

Let X be a Gaussian random variable with mean μ = 2.5 and standard deviation σ = 2.9. A new random variable Y is defined as: Y = 2.2 X + 2.3.

Find the mean value of Y. [7.8] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 7.8

Find the standard deviation of Y. [6.38] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 6.38

Find the correlation coefficient between X and Y. [1] *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 1.0

Your answer is correct

We take a sample of size 12 from a Gaussian population representing the service time at a gas station. The sample average is 6.6 minutes and the sample standard deviation is 1.3 minutes. Calculate the 90% confidence interval for the population mean

Probabilities for the standard normal distribution

TABLE of CRITICAL VALUES for STUDENT's t DISTRIBUTIONS

Chi-Square Distribution Table

The lower end of the confidence interval is 5.92€ *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 5.926001295748

The upper end of the confidence interval is 7.274 *[The answer should be a number rounded to five decimal places, don't use symbols such as %]*

✔

One possible correct answer is: 7.273998704252

Your answer is correct.

◀ Final Exam-Part1- Sunday January 24, 2021 - Time: 14:00 - 15:15

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