Answer Sheet

1) 0.2545	14) 2.45
2) 0.2182	15) 0.005
3) 0.1818	16) 0.049
4) 0	17) 0.995
5) 0.7455	18) 0.235
6) 0.6545	19) 3.25
7) 0.7636	20) 1.07
8) 0.2363	21) 97.38%
9) 2.04	22) 97.389%
10) 3.31	23) 0.11%
11) 1.82	24) 94.76%
12) 0.0129	25) 8.23%
13) 0.9871	26) Solutions

East Los Angeles College
Department of Mathematics
Math 227
Test 3

Consider the probability distribution below.

Number of Days Absent- Let x represent the number of days a student is absent in a semester.

x	P(x)
0	0.2545
1	0.2182
2	0.1818
3	0.1091
4	0.1091
5	0.0727
6	0.0545

What's the probability a student misses:

1) No days?
2) One day?
3) Two days?
4) Seven days?
5) At least one day?
6) No more than two days?
7) Less than four days?
8) More than three days?
9) What's the expected number of days? **Hundredths**
10) What's the variance for this distribution? **Hundredths**
11) What's the standard deviation for this distribution? **Hundredths**

Three Hearts Game- Las Vegas has the Three Hearts Game in which a person must select three different hearts from a standard deck to win a prize valued at $ 500. If it costs $ 4 to play this game, answer the following questions.

12) What's the probability of winning this game? **Ten-Thousandths**
13) What's the probability of losing this game? **Ten-Thousandths**
14) What's the expected value for this game? **Hundredths**

Social Media- According to a college survey, 65% of students have a social media account. If you select 5 students at random, what's the probability:

15) None have a social media account? **Thousandths**
16) One has a social media account? **Thousandths**
17) At least one has a social media account? **Thousandths**
18) Less than three have a social media account? **Thousandths**
19) What's the expected number who have a social media account? **Hundredths**
20) What's the standard deviation for this distribution? **Hundredths**

Social Media- According to a college survey, the amount of time students spend on social media is normally distributed with a mean of 85 minutes and a standard deviation of 18 minutes. What percent of students spend:

21) At least 50 minutes on social media? **Thousandths**
22) No more than 120 minutes on social media? **Thousandths**
23) More than 140 minutes on social media? **Thousandths**
24) Between 50 minutes and 120 minutes on social media? **Thousandths**
25) Less than 60 minutes on social media? **Thousandths**
26) What's your name?

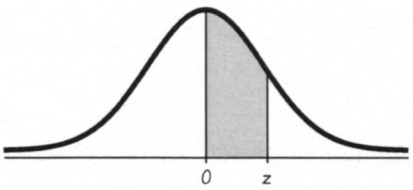

TABLE A-2 Standard Normal (z) Distribution

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495 *	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949 *	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990
3.10 and higher	.4999									

NOTE: For values of z above 3.09, use 0.4999 for the area.

*Use these common values that result from interpolation:

z score	Area
1.645	0.4500
2.575	0.4950

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math 227 Test 4

(1) No days ; $x = 0$

$$\boxed{p(0) = 0.2545}$$

(2) one day ; $x = 1$

$$\boxed{p(1) = 0.2182}$$

(3) two days ; $x = 2$

$$\boxed{p(2) = 0.1818}$$

(4) Seven days ; $x = 7$

$$\boxed{p(7) = 0}$$

(5) at least one day ; $x \geq 1$

$$p(x \geq 1) = p(1) + p(2) + \dots$$

$$= 1 - p(0)$$

$$= 1 - 0.2545$$

$$\approx \boxed{0.7455}$$

(6) No more than two days ; $x \leq 2$

$$P(x \leq 2) = P(0) + P(1) + P(2)$$

$$= 0.2545 + 0.2182 + 0.1818$$

$$= \boxed{0.6545}$$

(7) less than four days ; $x < 4$

$$P(x < 4) = P(0) + P(1) + P(2) + P(3)$$

$$= 1 - P(4) - P(5) - P(6)$$

$$= 0.2545 + 0.2182 + 0.1818 + 0.1091$$

$$= \boxed{0.7636}$$

(8) more than three days ; $x > 3$

$$P(x > 3) = P(4) + P(5) + P(6)$$

$$= 0.1091 + 0.0727 + 0.0545$$

$$= \boxed{0.2363}$$

(9) $\mu = \sum_{\text{all } x} x\,p(x)$

x	$p(x)$	$xp(x)$	$x^2 p(x)$
0	0.2545	0	0
1	0.2182	0.2182	0.2182
2	0.1818	0.3636	0.7272
3	0.1091	0.3273	0.9819
4	0.1091	0.4364	1.7456
5	0.0727	0.3635	1.8175
6	0.0545	0.327	1.962
		2.036	7.4524

(10) $\sigma^2 = \sum_{\text{all } x} x^2 p(x) - \mu^2$; $\mu \simeq 2.04$

$\sigma^2 = 7.4524 - 2.036^2$;

$\sigma^2 = 3.307104$; $\sigma^2 = 3.31$

(11) $\sigma = \sqrt{\sigma^2}$; $\sigma = \sqrt{}$

$\sigma = \sqrt{3.307104}$; $\sigma \simeq 1.82$

(12) Select 3 diff Hearts ; p(win)

$p(\text{1st } H) \cdot p(\text{2nd } H) \cdot p(\text{3rd } H)$

$= \frac{13}{52} \cdot \frac{12}{51} \cdot \frac{11}{50} \approx \boxed{0.0129}$

(13) $p(\text{lose}) = 1 - p(\text{win})$

$= 1 - 0.0129$

$\approx \boxed{0.9871}$

(14)

outcome		probability	
496	win	0.0129	$496 \cdot 0.0129$
-4	lose	0.9871	$-4 \cdot 0.9871$

$\mu = 496 \cdot 0.0129 - 4 \cdot 0.9871$

$\boxed{\mu \approx 2.45}$

probability Distribution

x = # students that have a social media acco

$p = 0.65$; $1-p = 0.35$; $n = 5$

(15) none have a social media account

$x = 0$; $p(x) = n\,C_x\, p^x (1-p)^{n-x}$

$p(0) = 5\,C_0\; 0.65^0\; 0.35^{5-0}$

$= 1 \cdot 1 \cdot 0.35^5 = 0.35^5$

$\approx \boxed{0.005}$

(16) one has a social media account

$x = 1$; $p(1) = 5\,C_1\; 0.65^1\; 0.35^{5-1}$

$p(1) = 5 \cdot 0.65 \cdot 0.35^4$

$\approx \boxed{0.049}$

(17) at least one ; $x \geq 1$

$$p(x \geq 1) = p(1) + p(2) + \cdots$$

$$= 1 - p(0)$$

$$= 1 - 0.005$$

$$= \boxed{0.995}$$

(18) less than three ; $x < 3$

$$p(x < 3) = p(0) + p(1) + p(2)$$

$$= 0.005 + 0.049 + p(2)$$

$$0.181$$

note $p(2) = {}^{5}C_{2}\, 0.65^{2}\, 0.35^{5-2}$

$$= 10 \cdot 0.65^{2} \cdot 0.35^{3}$$

$$\approx 0.181$$

$$\approx \boxed{0.235}$$

(19) $\mu = np$

$\mu = 5 \cdot 0.65$

$\boxed{\mu = 3.25}$

(20) $\sigma = \sqrt{np(1-p)}$

$\sigma = \sqrt{5 \cdot 0.65 \cdot 0.35}$

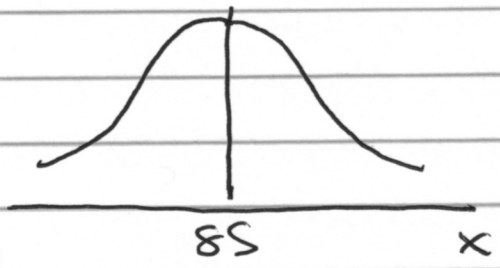
$\boxed{\sigma \approx 1.07}$

(21) Normal Distribution

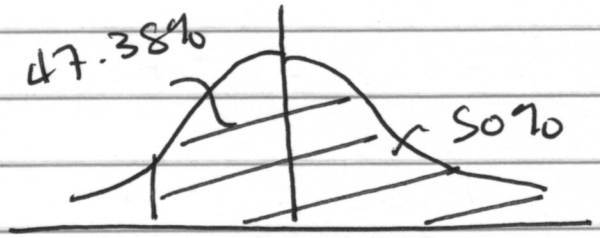
x = time spent on social media

$\mu = 85$; $\sigma = 18$

$$z = \frac{x - 85}{18}$$



(21) at least 50 minutes

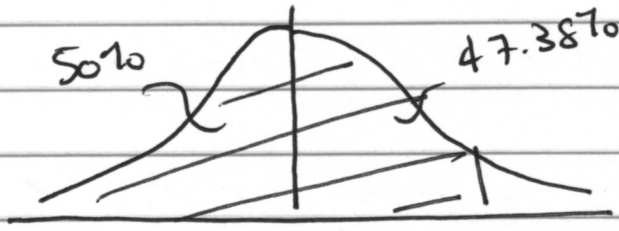


$$z = \frac{50 - 85}{18}$$

$$z \approx -1.94$$

$$47.38 + 50 = \boxed{97.38\%}$$

(22) No more than 120

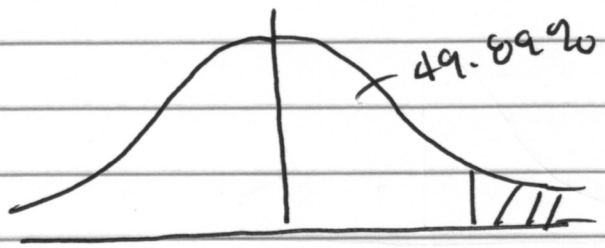


$$z = \frac{120 - 85}{18}$$

$$z \approx 1.94$$

$$50 + 47.38 = \boxed{97.38\%}$$

(23) more than 140



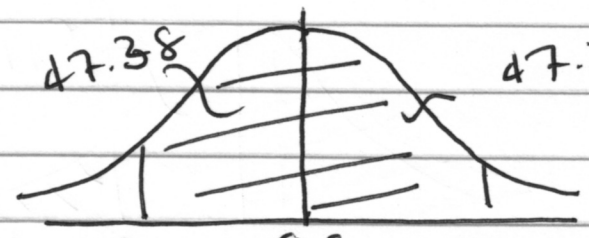
$$z = \frac{140 - 85}{18}$$

$$z \approx 3.06$$

$$50 - 49.89$$

$$\boxed{0.11\%}$$

(24) Between 50 and 120

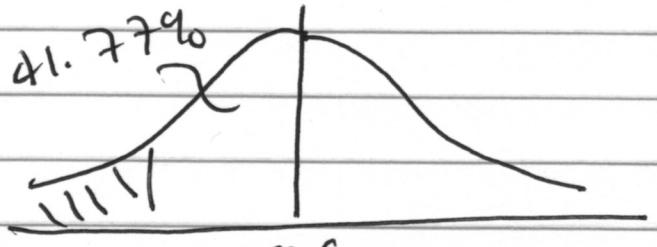


$z = \frac{50-85}{18}$

$z \approx$

$47.38 + 47.38 = \boxed{94.76\%}$

(25) less than 60 ; $x < 60$



$z = \frac{60-85}{18}$

$z \approx -1.39$

$50 - 41.77 = \boxed{8.23\%}$