

Math 130: Introductory Statistics
Worksheet: Central Limit Theorem

1. Make up data for 100 observations on the following page.
2. On pages 3 and 4, find the given observations and compute the mean for each sample of $n = 20$.
3. What is the mean of all the sample means? This is the mean of the *sampling distribution*.
4. Have James compute the standard deviation of all the means. This is the standard deviation of the *sampling distribution*.
5. Compute the z-score for each sample mean. That is, find out how many standard deviations each sample mean is away from the mean of the sampling distribution.
6. Have James show you a histogram of the sampling distribution. Describe the shape of the distribution.

Population (Random nonsense you all made up):

	0	1	2	3	4	5	6	7	8	9
00										
10										
20										
30										
40										
50										
60										
70										
80										
90										

Random Samples (Page 1):

1	2	3	4	5	6	7	8	9	10
21	73	94	57	51	53	71	35	12	96
30	64	31	85	91	73	21	44	26	81
74	76	67	6	12	70	43	58	44	67
74	92	19	35	39	64	97	11	83	48
92	28	92	38	88	67	66	39	91	64
29	34	90	72	24	33	18	10	91	39
9	96	46	13	43	69	83	15	96	73
37	69	71	77	37	85	96	62	8	68
26	75	96	85	66	15	2	100	34	97
17	62	17	13	73	10	21	63	45	60
93	23	99	61	42	2	28	52	95	74
18	25	16	17	48	40	19	80	26	49
5	83	34	78	49	59	18	11	64	86
52	30	68	88	52	11	40	36	88	58
79	23	89	28	32	2	63	56	90	55
33	48	12	52	71	4	12	33	5	63
74	78	90	59	70	38	25	78	86	77
31	13	32	93	47	9	60	86	21	54
71	5	85	29	97	15	47	41	92	17
93	27	49	37	16	41	40	4	47	18
$\bar{x}_1 =$	$\bar{x}_2 =$	$\bar{x}_3 =$	$\bar{x}_4 =$	$\bar{x}_5 =$	$\bar{x}_6 =$	$\bar{x}_7 =$	$\bar{x}_8 =$	$\bar{x}_9 =$	$\bar{x}_{10} =$
$z_1 =$	$z_2 =$	$z_3 =$	$z_4 =$	$z_5 =$	$z_6 =$	$z_7 =$	$z_8 =$	$z_9 =$	$z_{10} =$

Random Samples (Page 2):

11	12	13	14	15	16	17	18	19	20
70	90	76	63	90	2	67	7	36	52
76	77	61	3	82	59	75	33	91	23
63	49	24	61	89	30	60	63	68	67
43	65	82	8	85	97	10	64	3	53
88	89	91	97	75	95	43	37	73	85
47	14	88	90	30	89	64	89	85	21
21	42	87	87	51	93	76	26	62	73
66	56	64	86	16	68	89	76	58	1
23	73	94	76	90	77	32	57	55	64
90	85	14	83	56	8	31	33	53	31
72	9	65	42	34	74	40	76	83	40
23	44	41	89	36	68	75	95	15	60
73	41	79	77	50	71	85	43	99	91
28	25	36	64	36	1	30	3	97	26
70	68	92	78	59	24	79	18	51	97
3	100	0	66	21	69	37	49	9	40
44	42	29	9	42	47	75	32	76	65
96	18	69	0	85	63	20	64	62	65
94	18	24	86	92	98	34	0	79	33
13	52	66	9	19	36	52	51	38	60
$\bar{x}_{11} =$	$\bar{x}_{12} =$	$\bar{x}_{13} =$	$\bar{x}_{14} =$	$\bar{x}_{15} =$	$\bar{x}_{16} =$	$\bar{x}_{17} =$	$\bar{x}_{18} =$	$\bar{x}_{19} =$	$\bar{x}_{20} =$
$z_{11} =$	$z_{12} =$	$z_{13} =$	$z_{14} =$	$z_{15} =$	$z_{16} =$	$z_{17} =$	$z_{18} =$	$z_{19} =$	$z_{20} =$