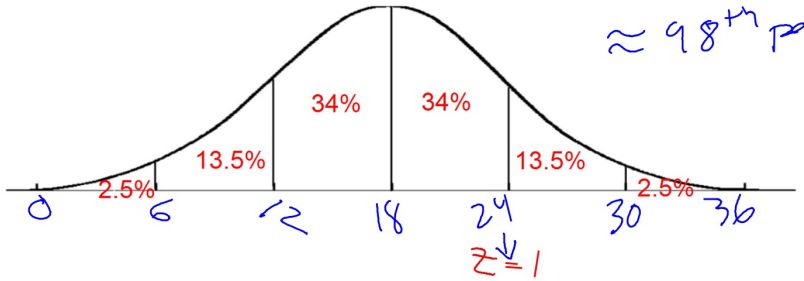
The mean score on the ACT is 18 with a standard deviation of 6. The scores are normally distributed

1. You got your results back and scored a 30. You did better than what % of those who took the test?

97.5 %
≈ 98th percentile



The mean score on the ACT is 18 with a standard deviation of 6. The scores are normally distributed

2. You did better than what % if your score was 20?

$$z = \frac{20-18}{6} = .333$$

$$z = 0.33$$

Since the z-score is not an integer you can't use the Normal Distribution curve. You must use a Normal Distribution Table. See the next page.

A z-score of 0.33 is where 62.93% of the data is below.

Therefore, if you scored a 20 then you did better than 62.93% of all the others who took the test.

STANDARD NORMAL DISTRIBUTION: Table Values Represent AREA to the LEFT of the Z score.

Z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.50000	.50399	.50798	.51197	.51595	.51994	.52392	.52790	.53188	.53586
0.1	.53983	.54380	.54776	.55172	.55567	.55962	.56356	.56749	.57142	.57535
0.2	.57926	.58317	.58706	.59095	.59483	.59871	.60257	.60642	.61026	.61409
0.3	.61791	.62172	.62552	.62930	.63307	.63683	.64058	.64431	.64803	.65173
0.4	.65542	.65910	.66276	.66640	.67003	.67364	.67724	.68082	.68439	.68793
0.5	.69146	.69497	.69847	.70194	.70540	.70884	.71226	.71566	.71904	.72240
0.6	.72575	.72907	.73237	.73565	.73891	.74215	.74537	.74857	.75175	.75490
0.7	.75804	.76115	.76424	.76730	.77035	.77337	.77637	.77935	.78230	.78524
0.8	.78814	.79103	.79389	.79673	.79955	.80234	.80511	.80785	.81057	.81327
0.9	.81594	.81859	.82121	.82381	.82639	.82894	.83147	.83398	.83646	.83891
1.0	.84134	.84375	.84614	.84849	.85083	.85314	.85543	.85769	.85993	.86214
1.1	.86433	.86650	.86864	.87076	.87286	.87493	.87698	.87900	.88100	.88298
1.2	.88493	.88686	.88877	.89065	.89251	.89435	.89617	.89796	.89973	.90147
1.3	.90320	.90490	.90658	.90824	.90988	.91149	.91309	.91466	.91621	.91774
1.4	.91924	.92073	.92220	.92364	.92507	.92647	.92785	.92922	.93056	.93189
1.5	.93319	.93448	.93574	.93699	.93822	.93943	.94062	.94179	.94295	.94408
1.6	.94520	.94630	.94738	.94845	.94950	.95053	.95154	.95254	.95352	.95449
1.7	.95543	.95637	.95728	.95818	.95907	.95994	.96080	.96164	.96246	.96327
1.8	.96407	.96485	.96562	.96638	.96712	.96784	.96856	.96926	.96995	.97062
1.9	.97128	.97193	.97257	.97320	.97381	.97441	.97500	.97558	.97615	.97670

Students who score in the top 10% of an achievement test qualify for a scholarship. The scores are normally distributed

The test had a mean of 86 and a standard deviation of 7.

1. If you had a score of 92 what % of those who took the test did better than you?

This is the % below: 80.51% ← $z = \frac{92-86}{7} = 0.86$ use the table on the next page

To get the % above subtract from 100.

100 − 80.51 = 19.49%

2. You need to get at least what score to qualify for the scholarship?

$z = 1.28 = \frac{x-86}{7}$

$x = 95$

If you are in the top 10% it means you scored higher than 90% of the others. Use the table on the following page to find the z-score that comes as close as possible to representing 90% below...0.9000
0.89973 is the closest you can come to 0.9000, therefore, you want to get a z-score of at least 1.28

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1.9	.97128	.97193	.97257	.97320	.97381	.97441	.97500	.97558	.97615	.97670

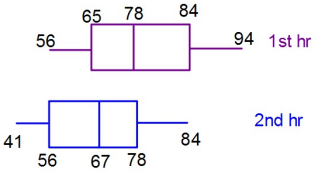
$z = 0.86$

$z = 1.28$

Below are statistics from at test given to two classes:

1st hour: MinX = 56 Q_1 = 65 Med = 78 Q_3 = 84 MaxX = 94

2nd hour: MinX = 41 Q_1 = 56 Med = 67 Q_3 = 78 MaxX = 84



1. Make a box-and-whisker plot of each hour. Label the 5 numbers on each.

2. If you scored a 65 in 1st hour what % did better than you? 75%

3. If your score in 2nd hour was 78, you did better than what %? 75%

4. Which class did better on the test? Give reasons for your answer using the box-and-whisker plots.

1st hour because....below are some reasons you could use:

- nobody in 1st hour scored below 56 but 25% of 2nd scored below 56
- 50% of 1st hour scored above 78 but only 25% of 2nd hour scored above 78
- The highest score in 2nd hour was 84 but 25% of 1st hour scored higher than 84

There are 14 players trying out for the team. You plan on keeping only 10 players.

1. How many ways can you pick a team of 10 players?

$_{14}C_{10}$

2. Once the team is picked how many ways can you pick five of them to start a game?

$_{10}C_{5}$

3. Once a starting group is picked how many ways can they be announced at the begining of the game?

$_{10}P_{5}$