**Z-scores**

**(1) A normally shaped distribution of test scores has a mean of 500 and a standard deviation of 100. Use the abbreviated table of the normal curve (z-distribution) below.**

 **(a) What is the percentile rank of a raw score of X = 450?**

$z= \frac{X- μ}{σ}$

$z= \frac{450- 500}{100}$ = -.5

According to the table:

🡪Larger Proportion = .69

🡪Smaller Proportion = .31

-if you draw this out, you will see that we want the smaller proportion

.31 \* 100 = **31st Percentile**

**(b) What is the probability of choosing a single score that is greater than 650?**

$z= \frac{X- μ}{σ}$

$z= \frac{650- 500}{100}$ = +1.5

According to the table:

-Larger Proportion = .93

-Smaller Proportion = .07

-if you draw this out, you will see that we want the smaller proportion

**Probability = .07 or 7%**

|  |  |  |  |
| --- | --- | --- | --- |
| **z** | **Mean to Z** | **Larger Proportion** | **Smaller Proportion** |
| 0 | .0 | .50 | .50 |
| .2 | .08 | .58 | .42 |
| .4 | .16 | .66 | .34 |
| .5 | .19 | .69 | .31 |
| .6 | .23 | .73 | .27 |
| .8 | .29 | .79 | .21 |
| 1 | .34 | .84 | .16 |
| 1.2 | .38 | .88 | .12 |
| 1.5 | .43 | .93 | .07 |
| 1.645 | .45 | .95 | .05 |
| 1.96 | .475 | .975 | .025 |
| 2 | .48 | .98 | .02 |