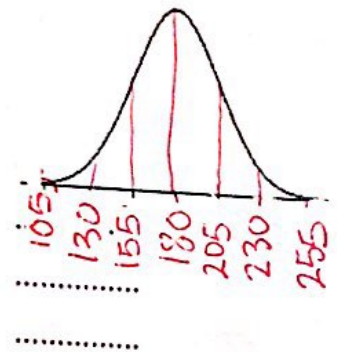


Practice Quiz (Normal Distribution, Empirical Rule, Z-Scores)

- If a person has a negative z-score, did the person score higher or lower than the mean? lower
- If a person has a negative z-score, it does not always mean that the person did not do well. Name a sport where having the lowest z-score would be the most desirable. golf, track

For #3 - 9: The mean weight of adult American men is 180 pounds with standard deviation of 25 pounds. The weights are approximately normally distributed. Use the 68%-95%-99.7% Rule to approximate each of the following.

- Using the values given above, label the normal curve at the right with the numerical values for μ , $\mu \pm \sigma$, $\mu \pm 2\sigma$ and $\mu \pm 3\sigma$.



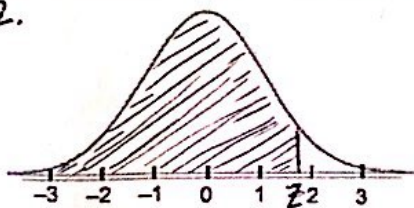
- What percent of all adult American men have a weight less than 130 pounds? $2.35 + .15 = 2.5$
 - What percent of all adult American men have a weight between 130 and 205 pounds? $13.5 + 34 + 34 = 81.5$
 - What percent of all adult American men have a weight less than 230 pounds? $50 + 34 + 13.5 = 97.5$
 - What percent of all adult American men have a weight less than 105 pounds? $.15$
 - The heaviest 16% of all men in weight weigh more than how many pounds? 205
 - What weight separates the lowest 2.5% of all American men in weight from the remaining weights? 130
10. Maria made 75% on her Government test and 83% on her Algebra 2 test. The mean grade on the Government test was 72% with a standard deviation of 5%. The average grade on the Algebra 2 test was 81% with a standard deviation of 4%. On which test did Maria do better? Justify your answer.
- $\frac{75 - 72}{5} = .6$ $\frac{83 - 81}{4} = \frac{2}{4} = .5$ Government test is higher

Fill in numbers for the blanks.

- For a standard normal distribution, the mean μ is always 0 and the standard deviation σ is always 1.

Find the shaded area for each standard normal distribution.

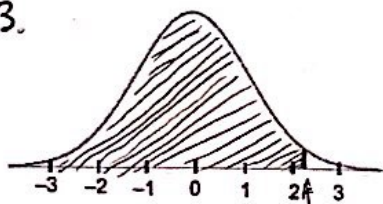
12.



$z = +1.83$

.96683

13.

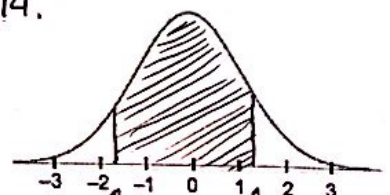


$z = 2.18$

$1 - .98537$

.01463

14.



$z = -1.7$

$1.23 = z$

$.89065 - .04457$

.84608

15. The data below represents the scores in a golf tournament. If the mean is 70 with a standard deviation of 4.9, circle all values with a z-score greater than 0.5.

63, 64, 65, 67, 70, 71, 73, 73, 76, 78

$$0.5 = \frac{x-70}{4.9}$$

$$2.45 = x-70$$

$$x = 72.45$$

16. The data below represents the number of medals won by the top ten countries in the 2014 Winter Olympics. If the mean is 20.4 and the standard deviation is 7.9, circle all values that fall within one standard deviation of the mean.

6, 11, 15, 17, 19, 24, 25, 26, 28, 33

$$12.5 \leq x \leq 28.3$$



17. Select the correct alternative:

A normal distribution with a large standard deviation is (more peaked / flatter) than one with a small standard deviation.

18. Where is the median (middle score) of the normal distribution? Give a reason for your answer. *On the axis of symmetry. The median & mean are equal on a normal distribution.*

19. Where is the mode (most common score) of the normal distribution? Give a reason for your answer. *The mode is also the axis of symmetry.*

20. Figure 7 shows two normal distribution curves representing the time taken to prepare personal ("S") and business ("A") income tax returns:

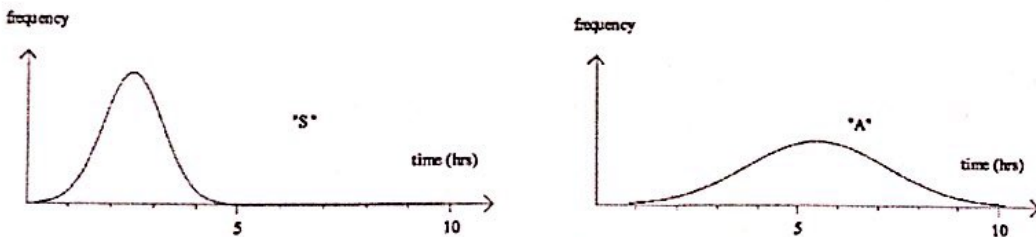


Figure 7: Two normal distribution curves.

- (a) Which has the larger mean? **A**
- (b) Which has the larger standard deviation? **A**