Normal Probability Distribution Backwards Worksheet Solutions

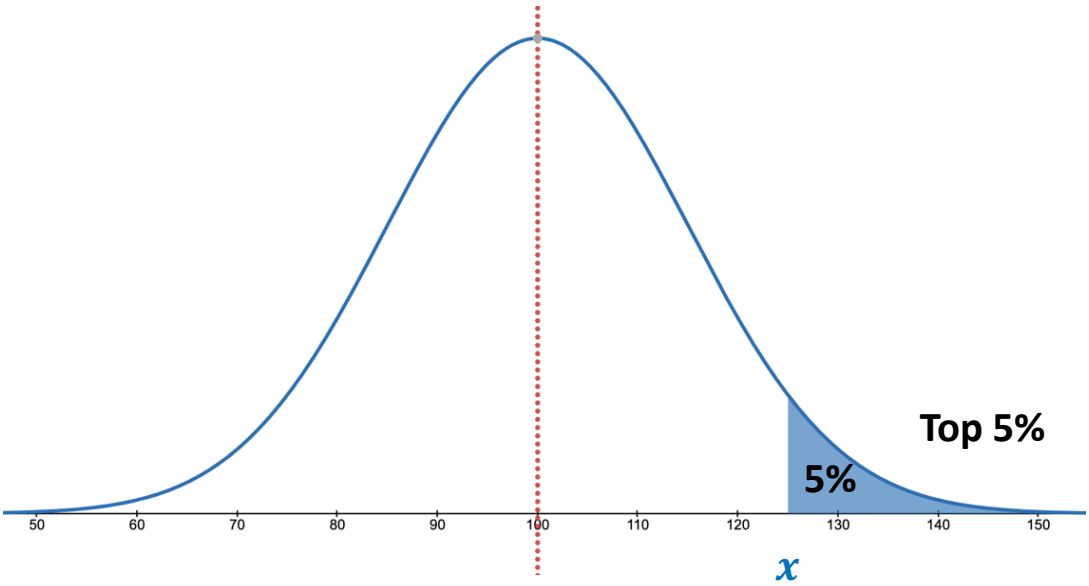
IQ Scores

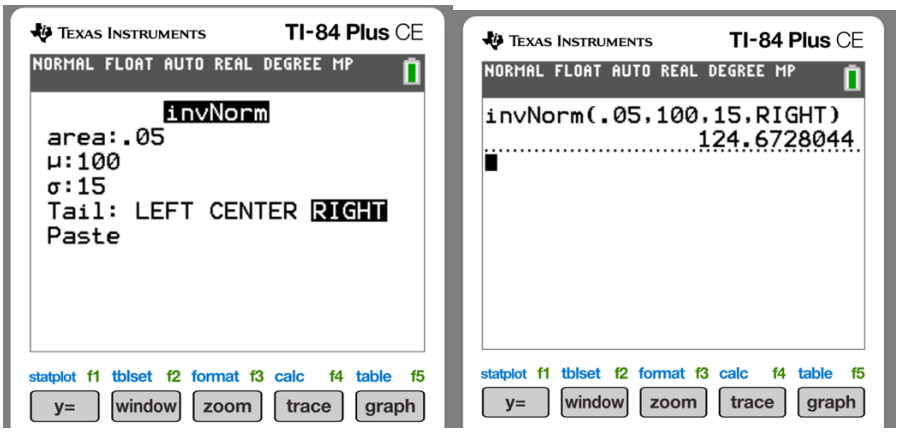
IQ scores are normally distributed with a mean of 100 and a standard deviation of 15. If you select a person at random, what's then probability the person has an IQ score that is:

Approximate your answers to the nearest thousandths.

$$x = \text{IQ Scores},\ \mu = 100,\ \sigma = 15$$

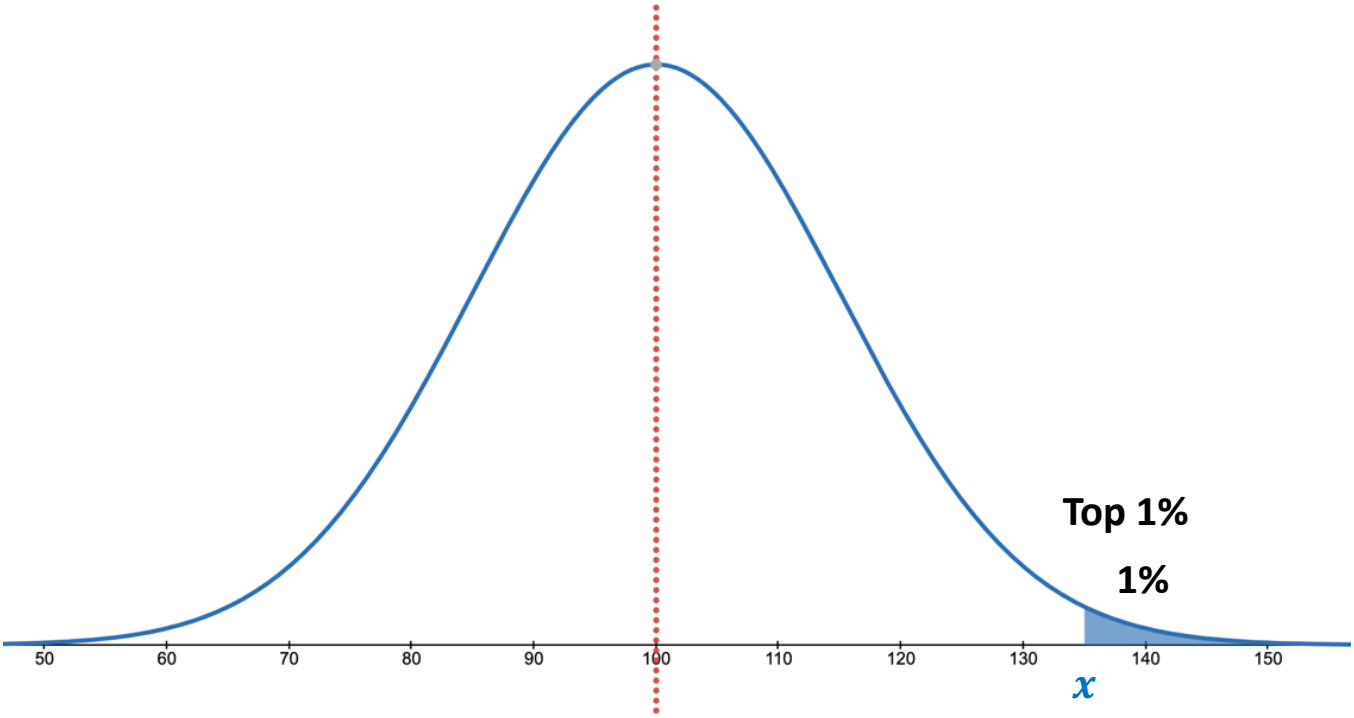
1. What IQ score represents the **Top 5%**? P_{95}



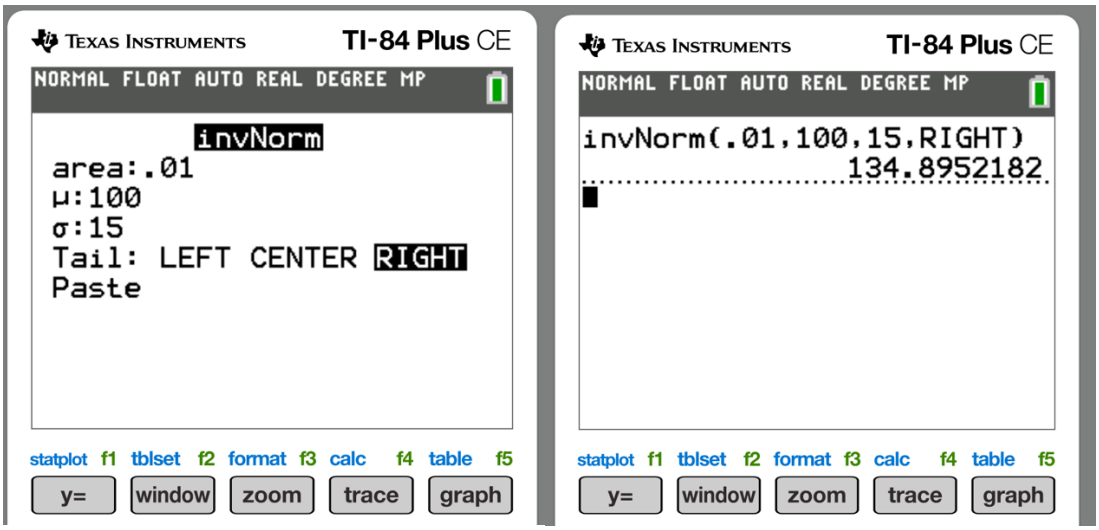


$$x \approx 125$$

2. What IQ Score represents the **Top 1%**? P_{99}

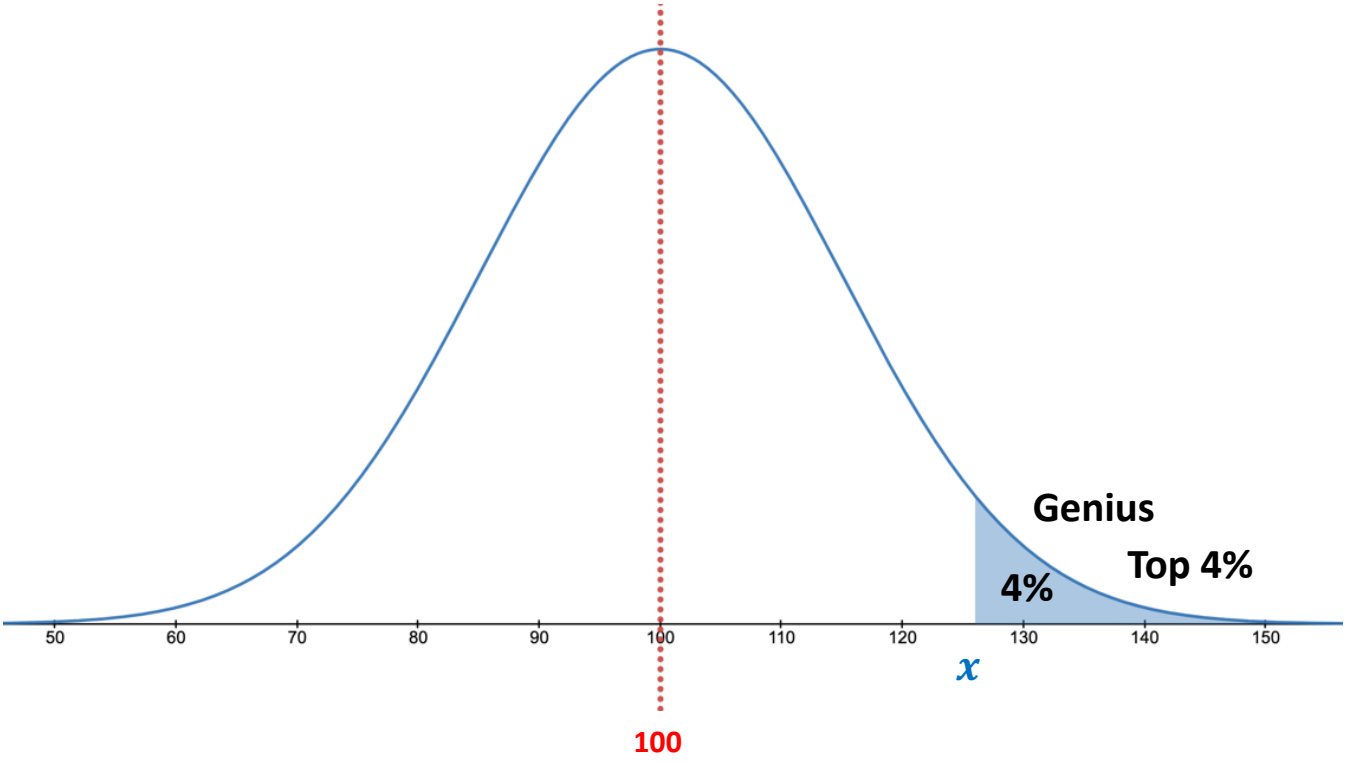


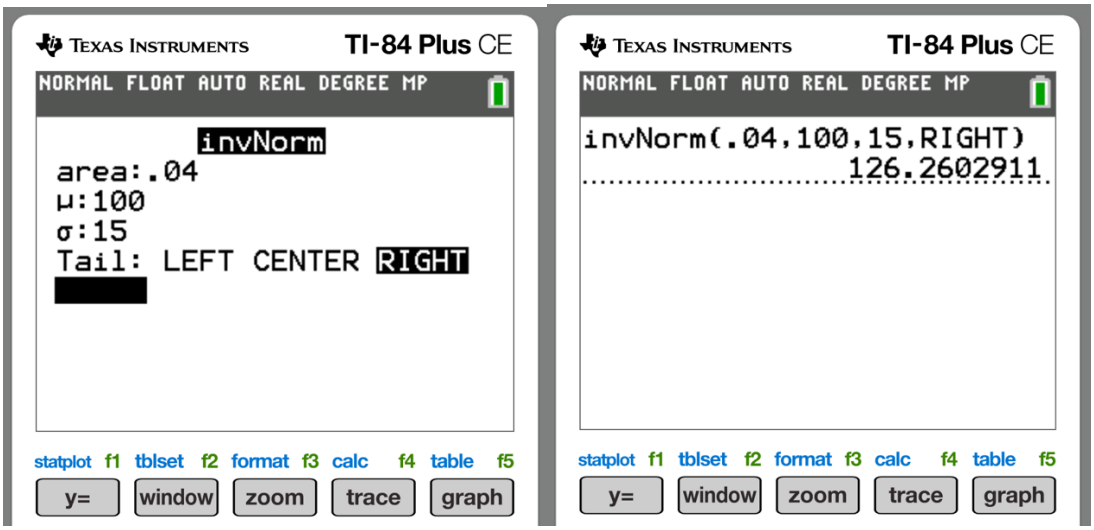
100



$x \approx 135$

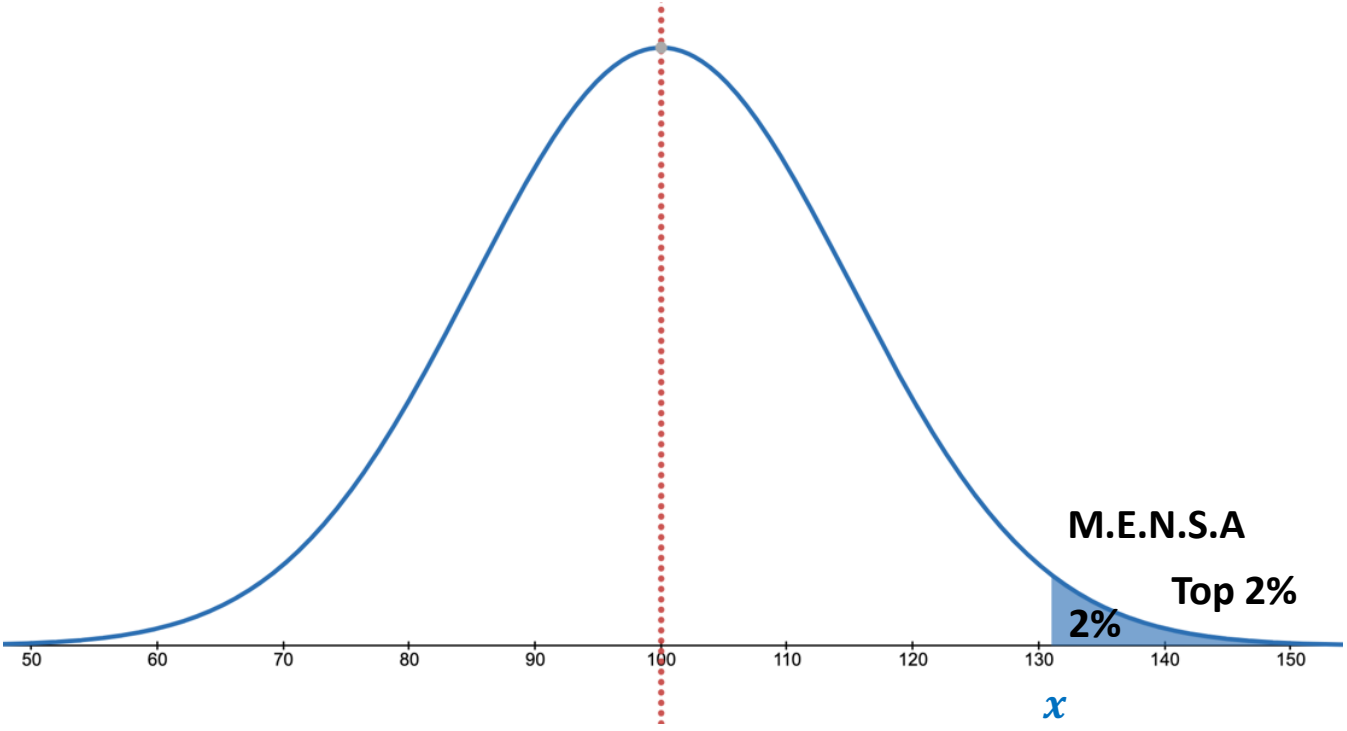
3. What IQ Score represents a **Genius (Top 4%)**? P_{96}



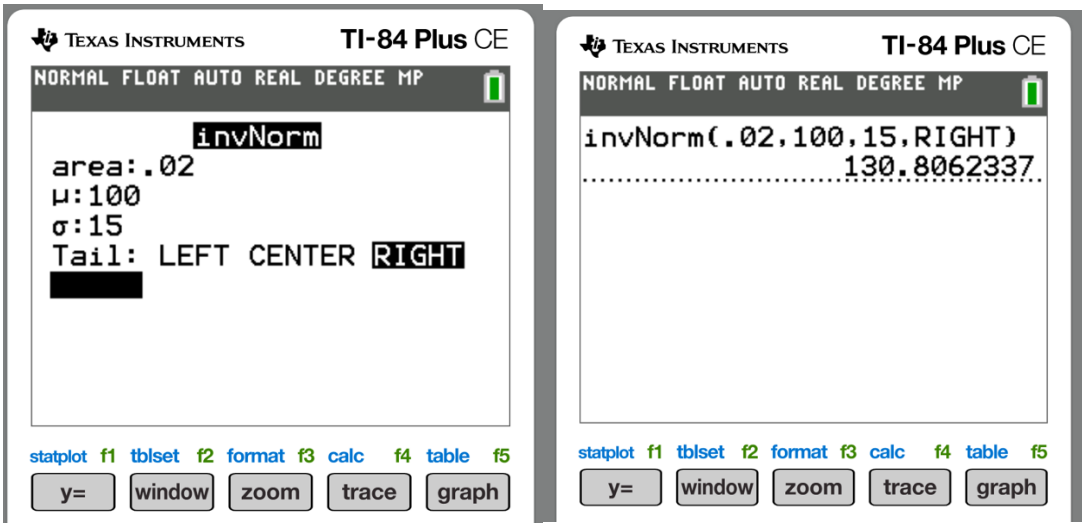


$x \approx 126$

4. What IQ score is used to meet the M.E.N.S.A. requirement **(Top 2%)**? P_{98}



100



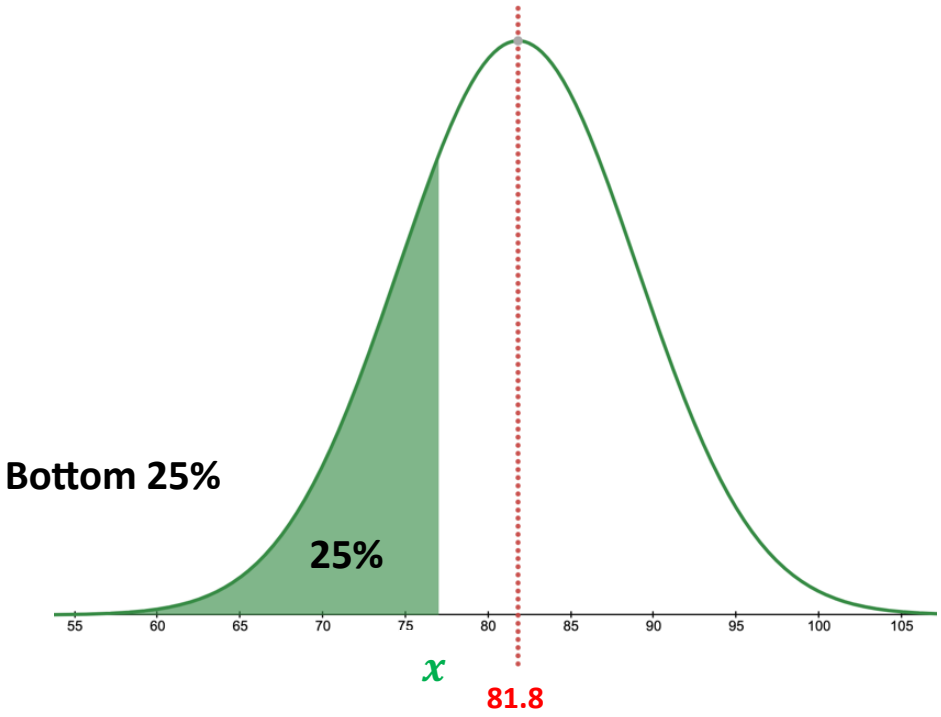
$x \approx 131$

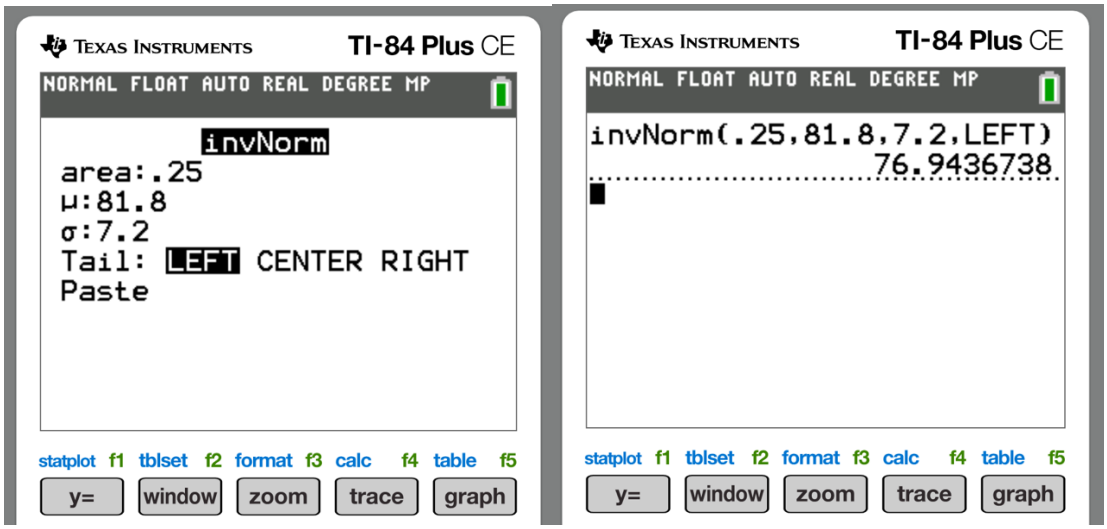
California Life Expectancy

California residents have a mean life Span of 81.8 years with a standard deviation of 7.2 years. If you select a California resident at random, what's the probability the California resident lives: **Approximate your answers to the nearest thousandths.**

$$x = \text{life Span (years)},\ \mu = 81.8,\ \sigma = 7.2$$

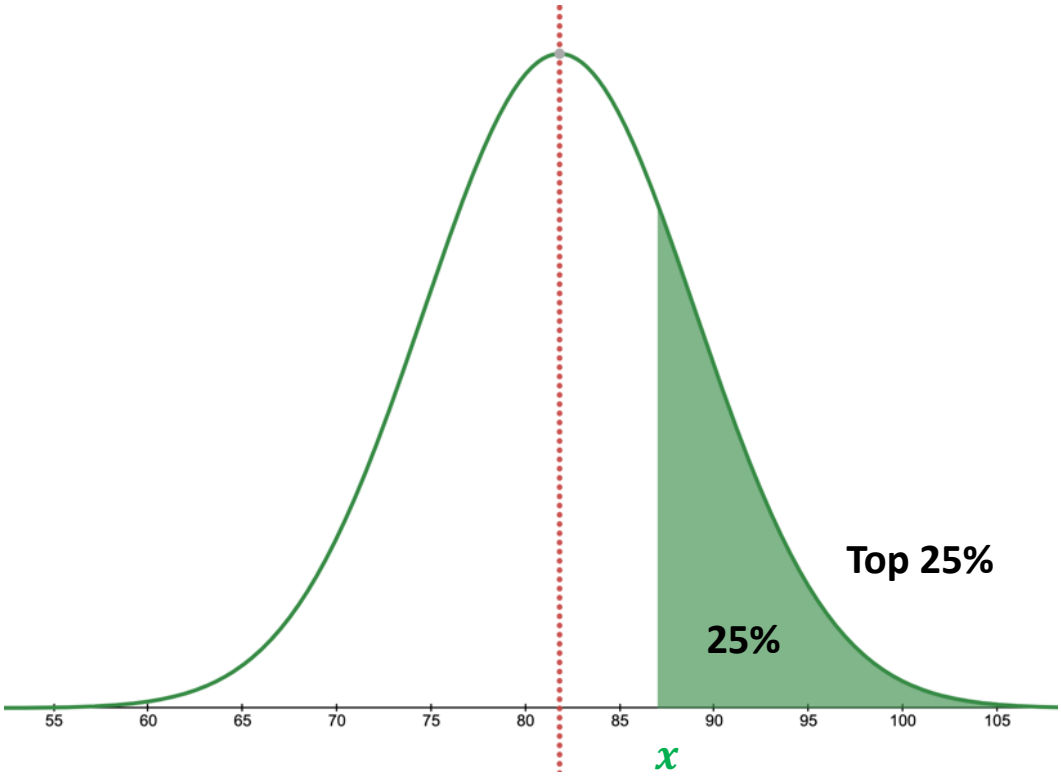
5. What lifespan represents the **1st Quartile**? $Q_1 = P_{25}$ **Bottom 25%**



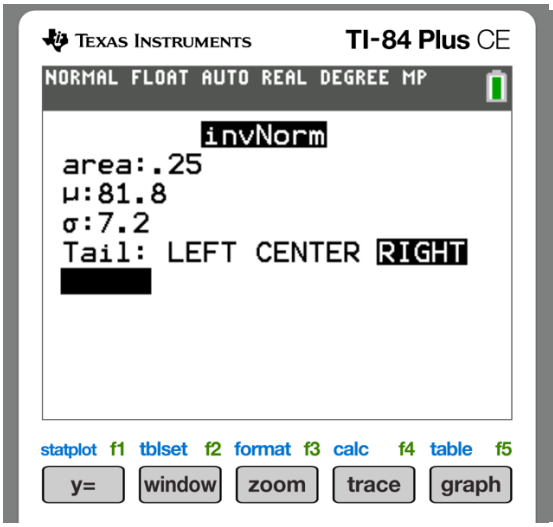


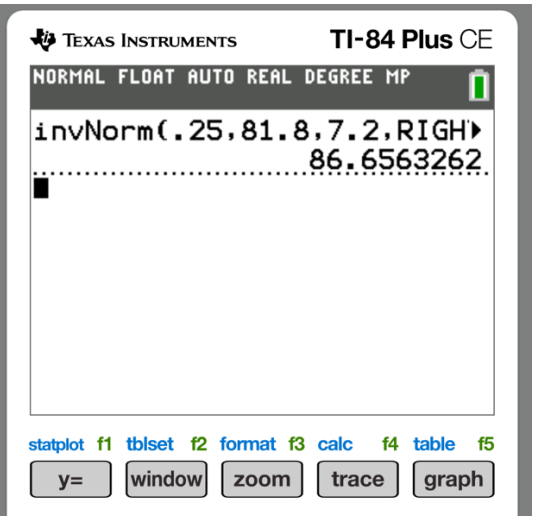
$$x \approx 77$$

6. What lifespan represents the **3rd Quartile**? $Q_3 = P_{75}$ **Top 25%**



81.8





$x \approx 87$

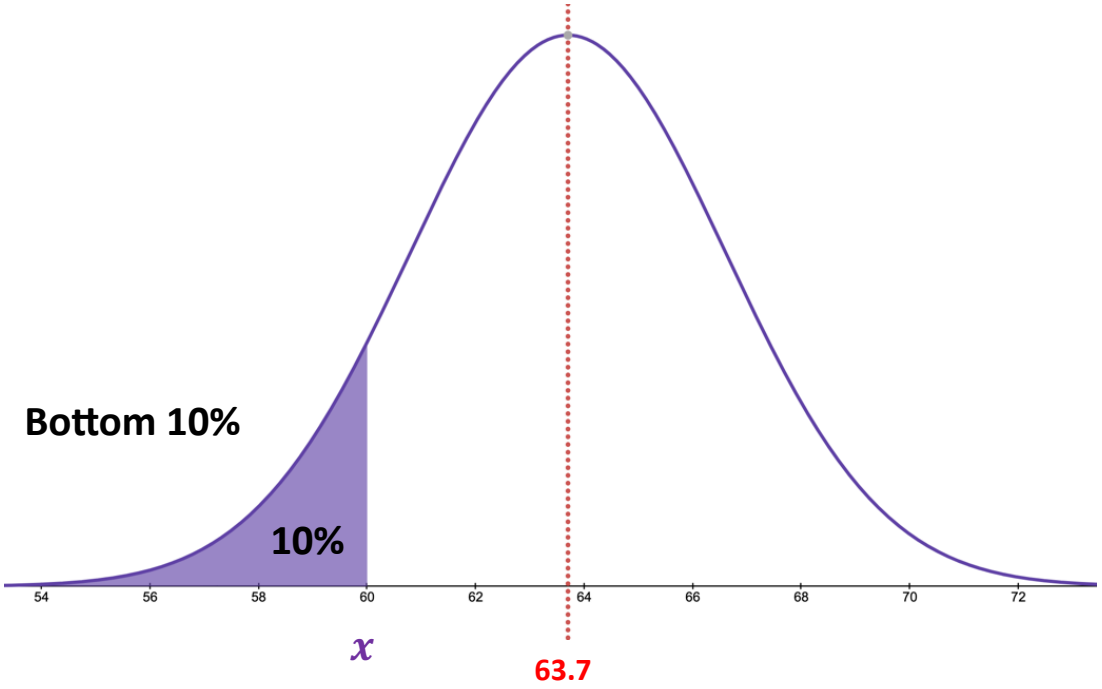
Height of Women

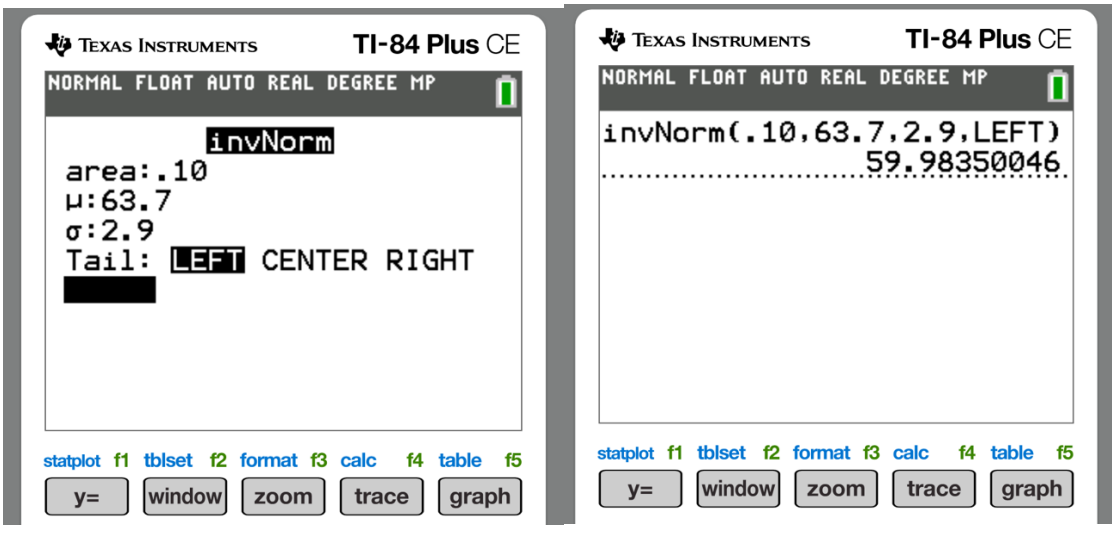
The height of women is normally distributed with a mean of 63.7 inches and a standard deviation of 2.9 inches. If you select a woman at random, what's the probability a woman will be:

Approximate your answers to the nearest thousandths.

$$x = \text{height of women},\ \mu = 63.7,\ \sigma = 2.9$$

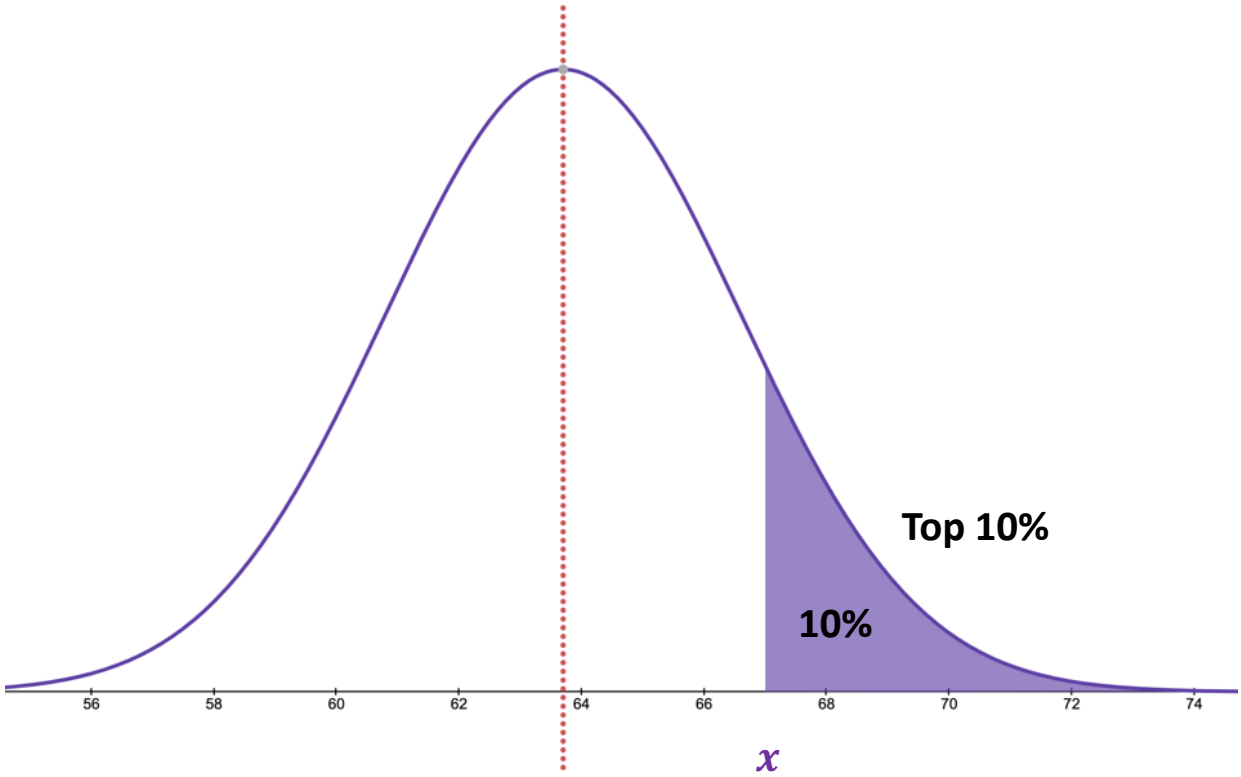
7. What height represents the **Bottom 10%?** $D_1 = P_{10}$



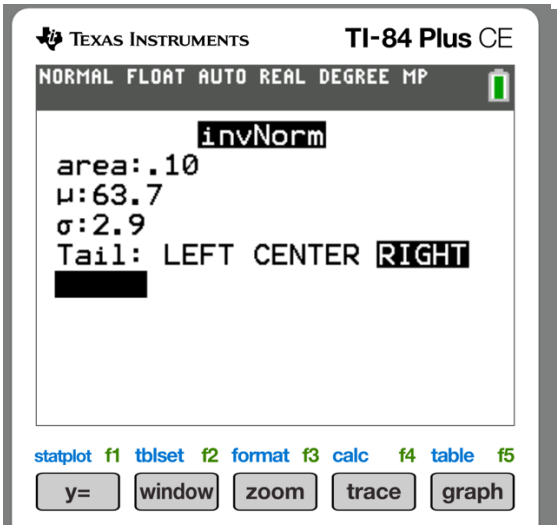


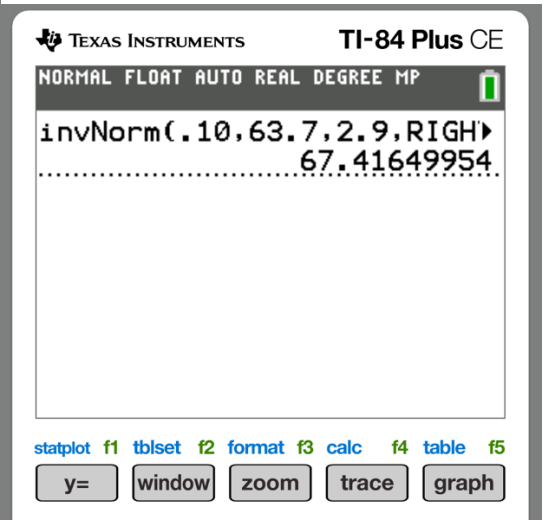
$$x \approx 60$$

8. What height represents the **Top 10%?** $D_9 = P_{90}$



63.7





$x \approx 67$

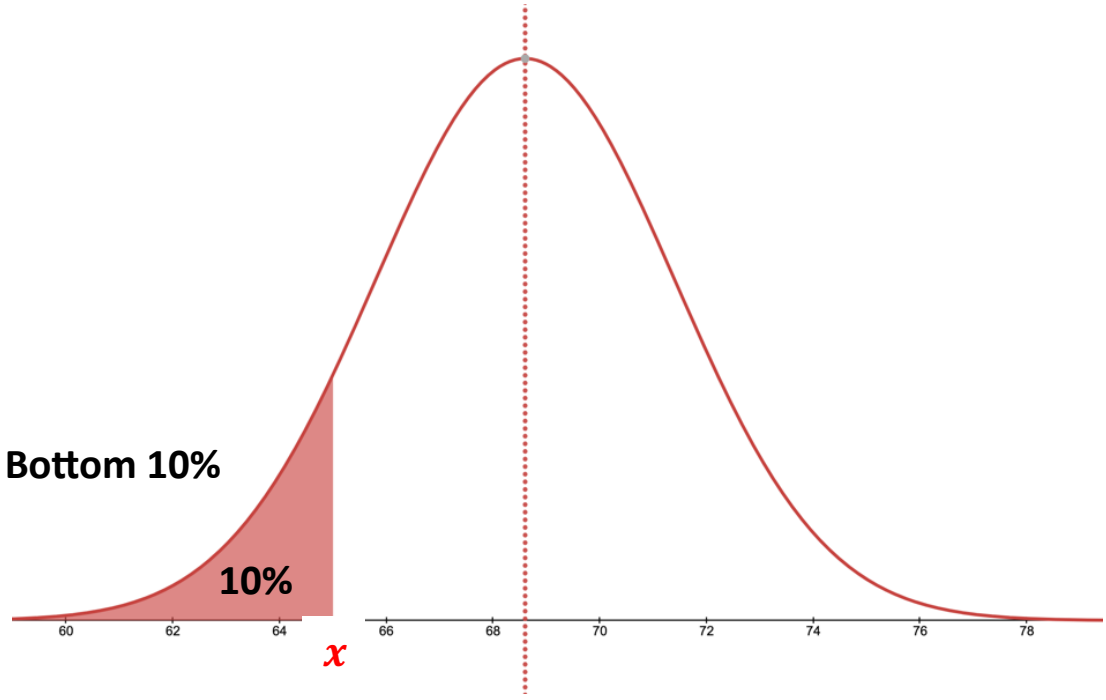
Height of Men

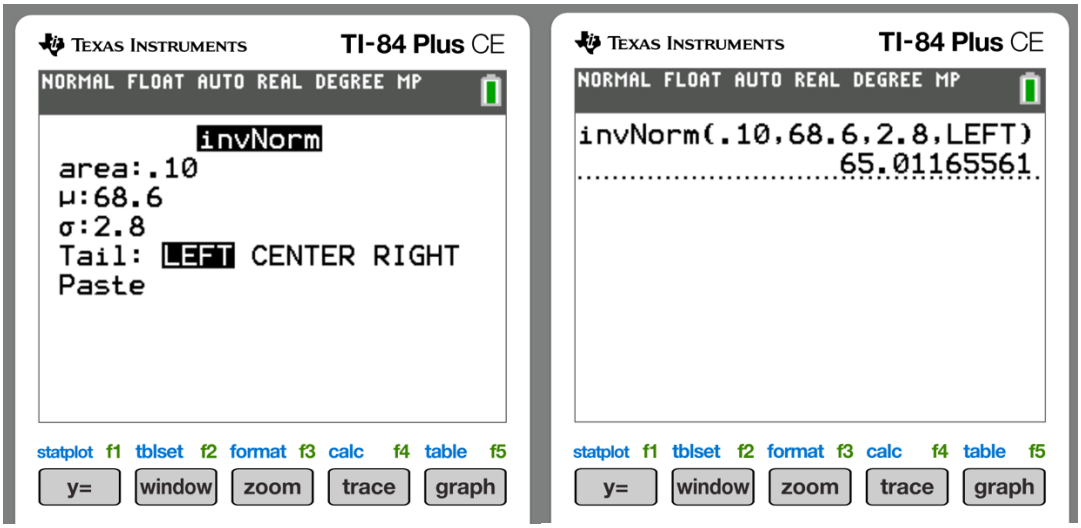
The height of women is normally distributed with a mean of 68.6 inches and a standard deviation of 2.8 inches. If you select a man at random, what's the probability the man will be:

Approximate your answers to the nearest thousandths.

$$x = \text{Height of men, } \mu = 68.6, \sigma = 2.8$$

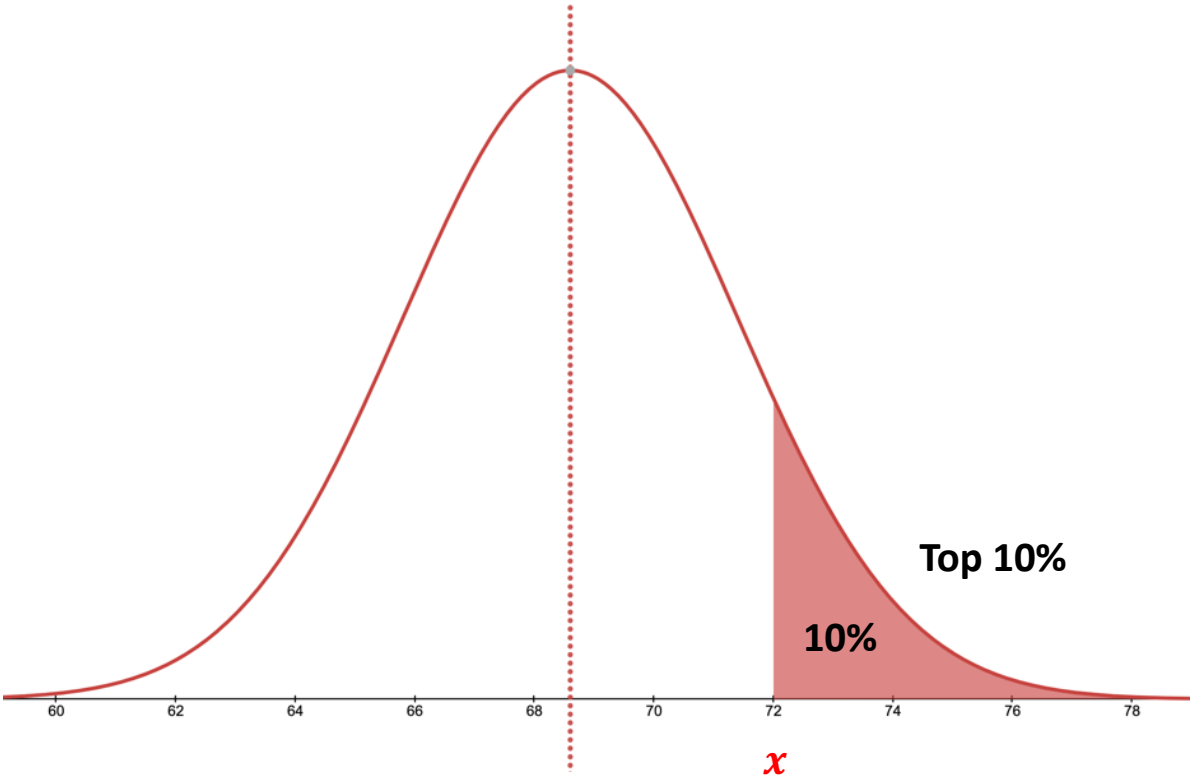
9. What height represents the **1st Decile**? $D_1 = P_{10}$ **Bottom 10%**

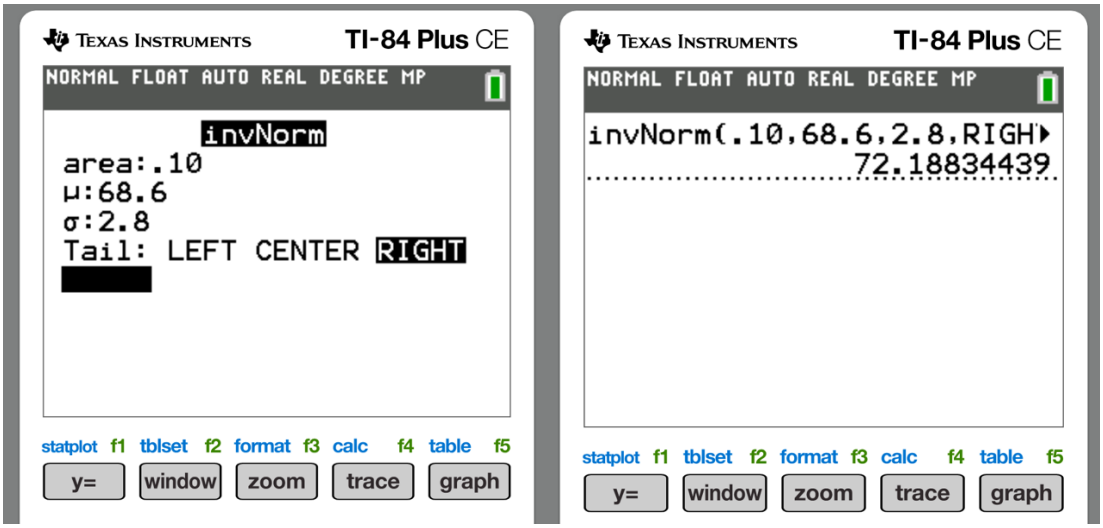




$$x \approx 6$$

10. What height requirement represents the **9th Decile**? $D_9 = P_{90}$ **Top 10%**



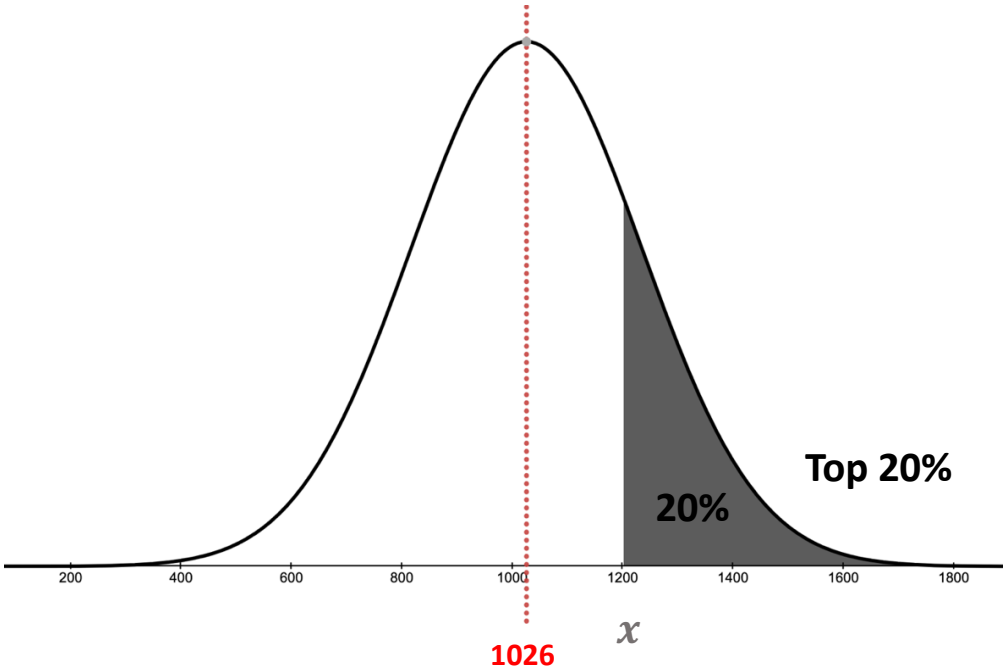


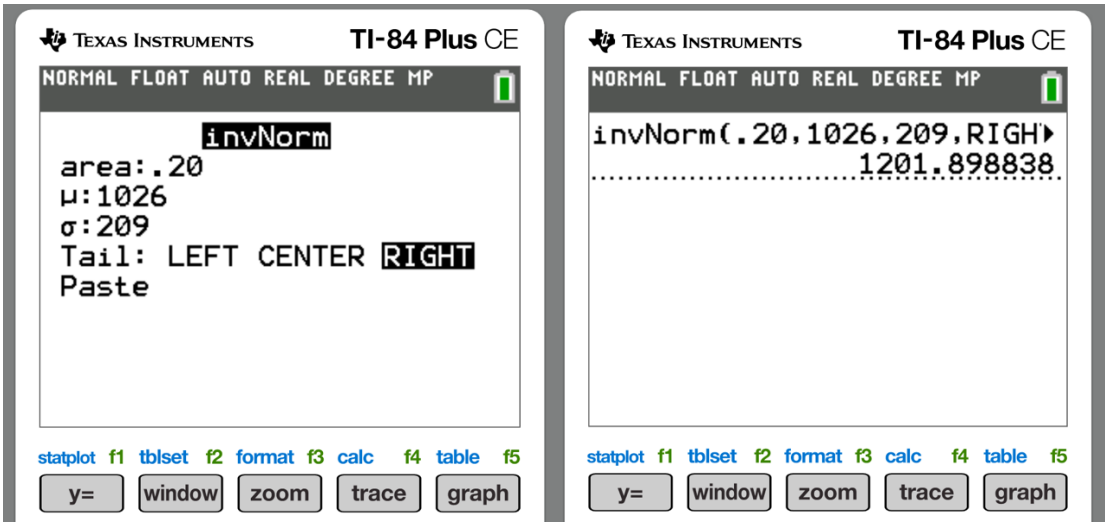
$x \approx 72$

SAT Scores (Scholastic Aptitude Test)
SAT scores are normally distributed with a mean of 1026 and a standard deviation of 209. What **percent** of students who take the SAT will score:
Approximate your answers to the nearest thousandths.

$$x = \text{SAT Score},\ \mu = 1026,\ \sigma = 209$$

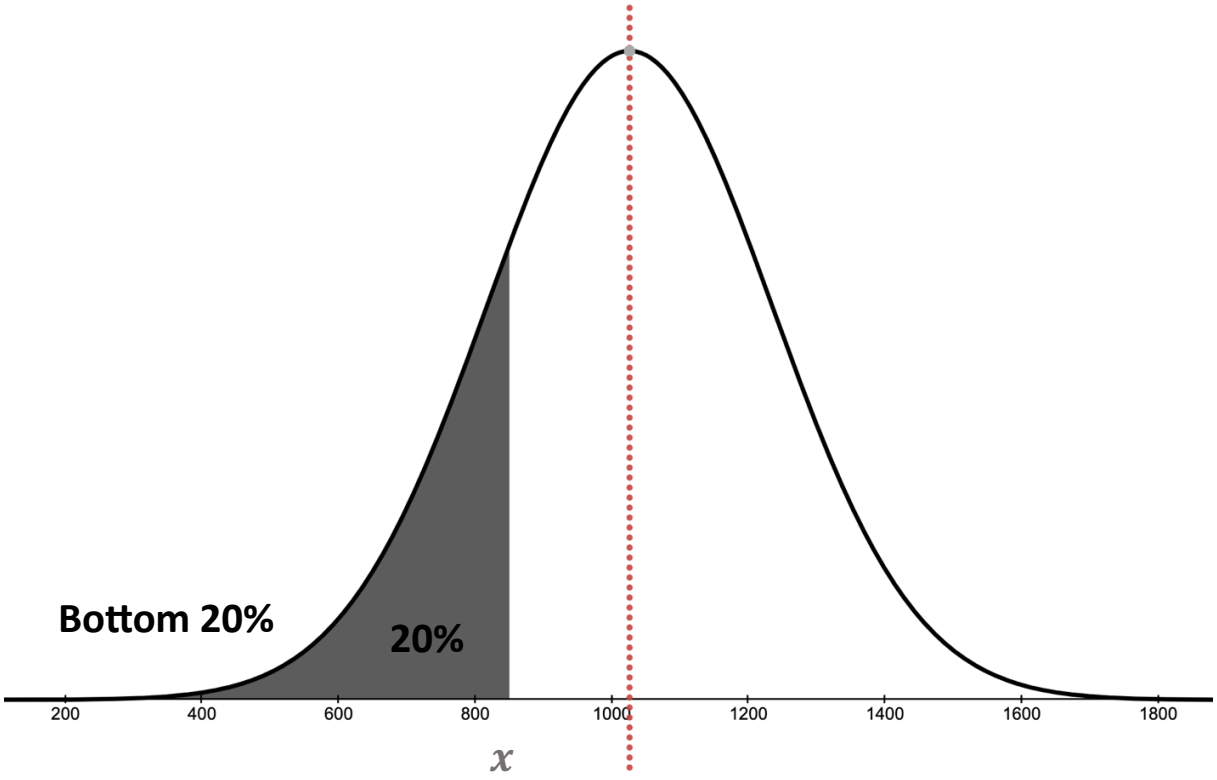
11. What SAT Score represents the **8th Decile**? $D_8 = P_{80}$ Top 20%



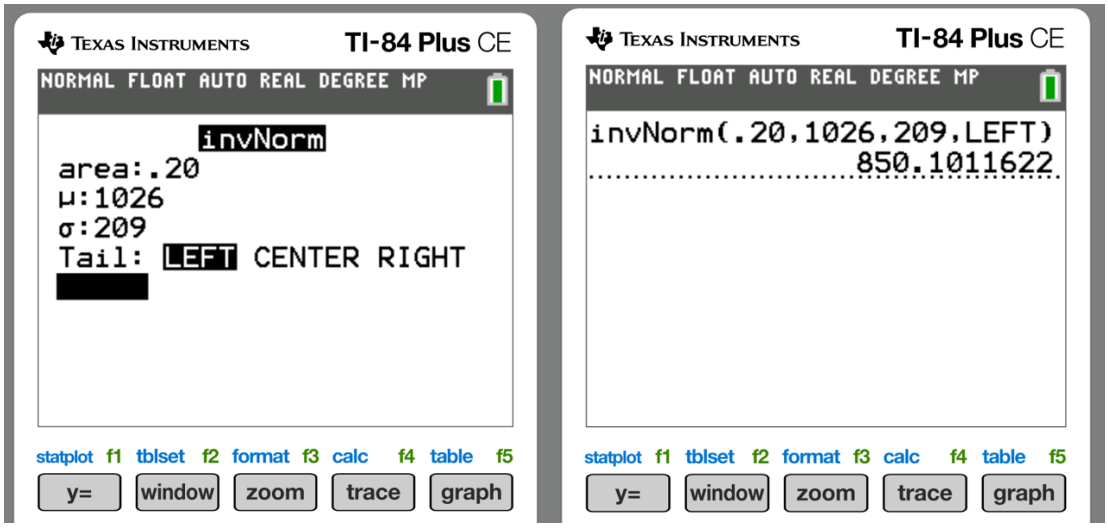


$$x \approx 1202$$

12. What SAT Score represents the **2nd Decile**? $D_2 = P_{20}$ **Bottom 20%**

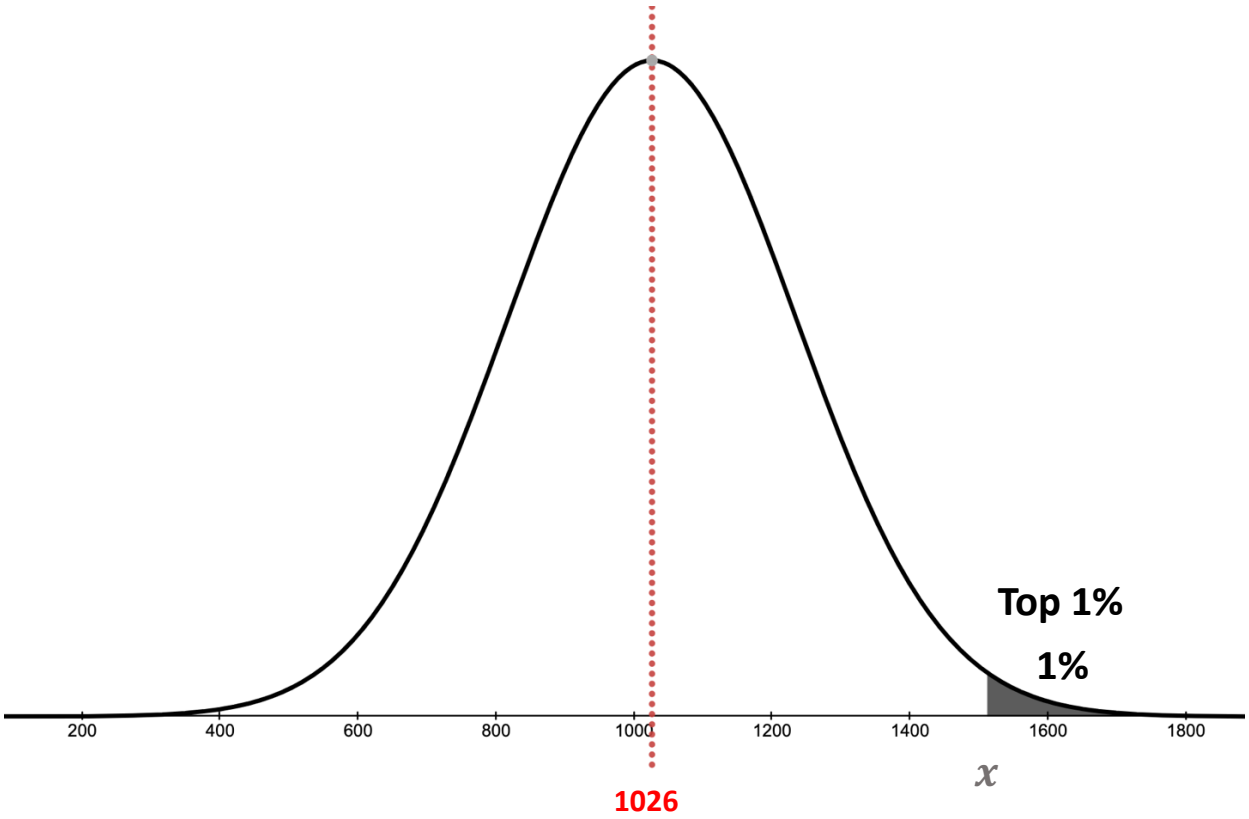


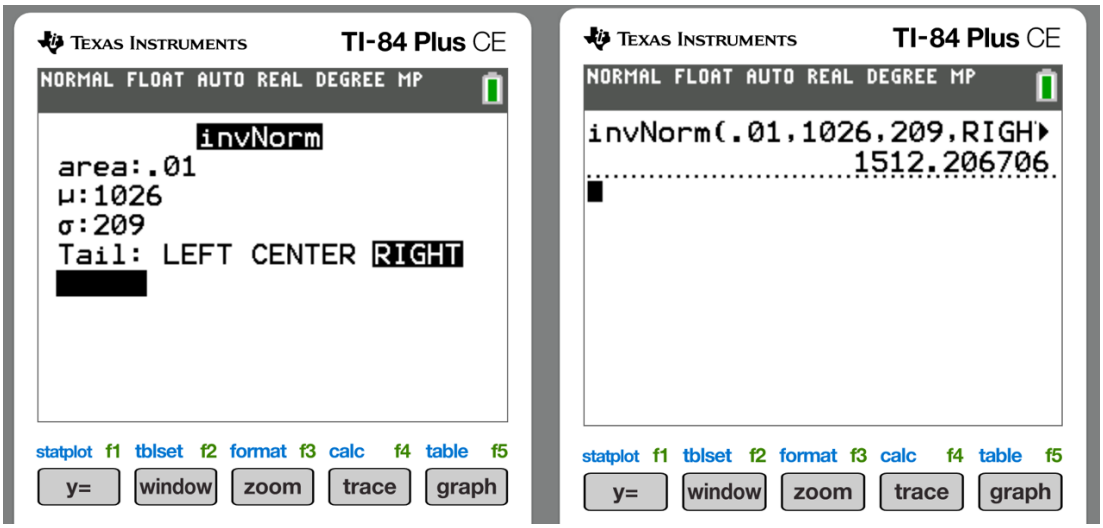
1026



$x \approx 850$

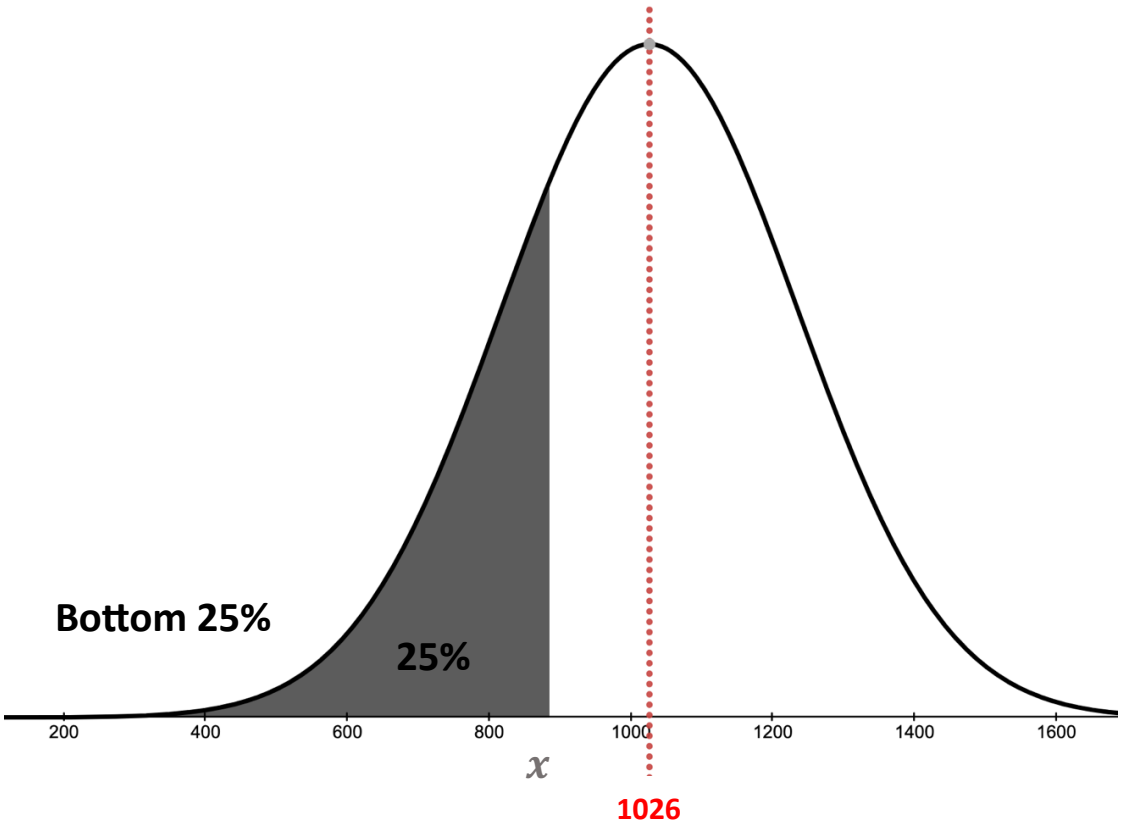
13. What SAT Score represents the **Top 1%?** P_{99}

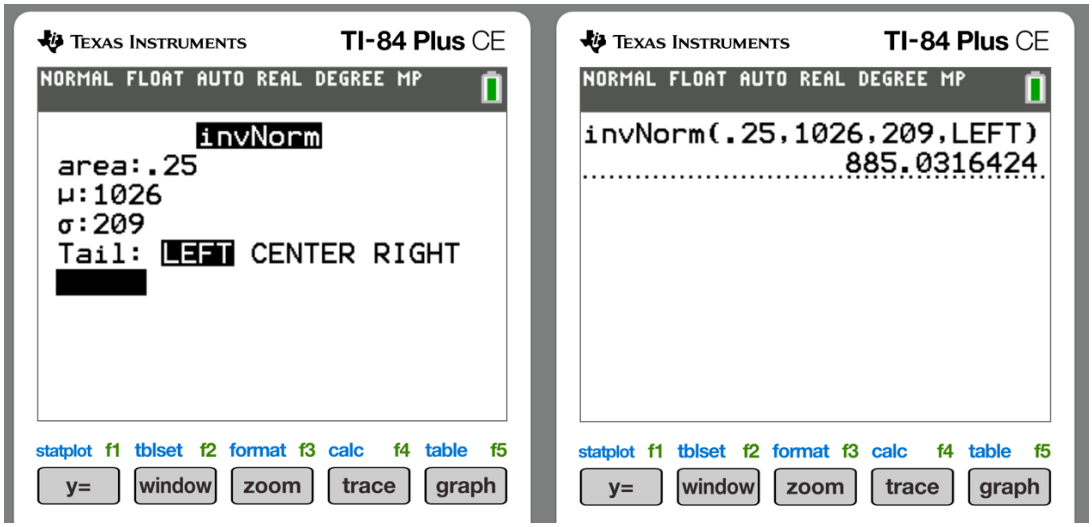




$x \approx 1512$

14. What SAT Score represents the **1st Quartile**? $Q_1 = P_{25}$ **Bottom 25%**





$x \approx 885$