Normal Probability Distribution Solutions

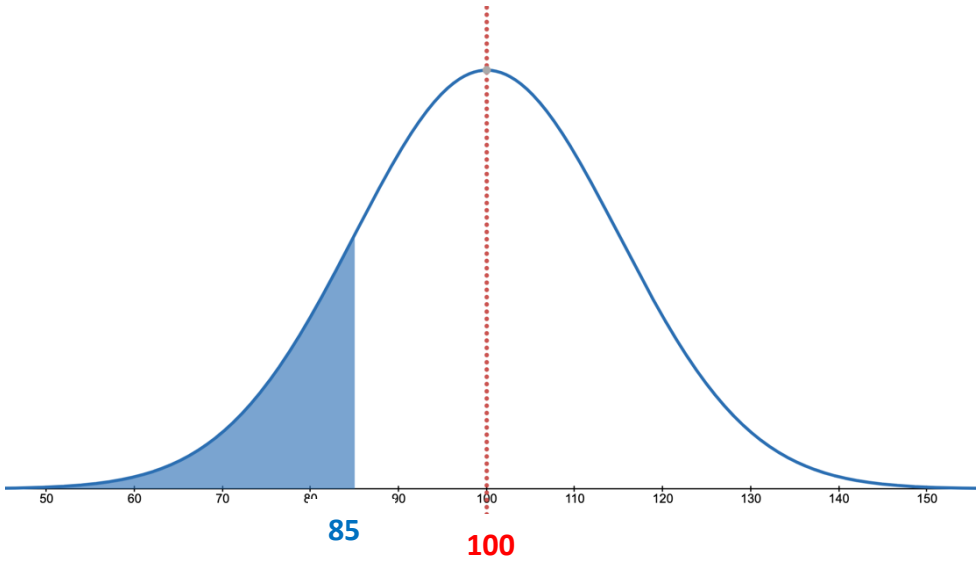
IQ Scores

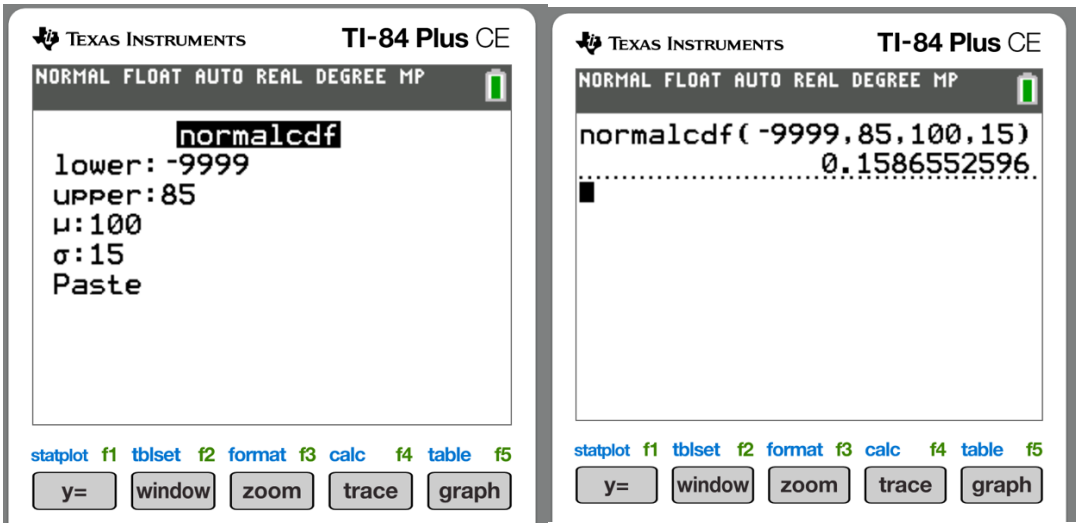
IQ scores are normally distributed with a mean of 100 and a standard deviation of 15. If you select a person at random, what's then probability the person has an IQ score that is:

Approximate your answers to the nearest thousandths.

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

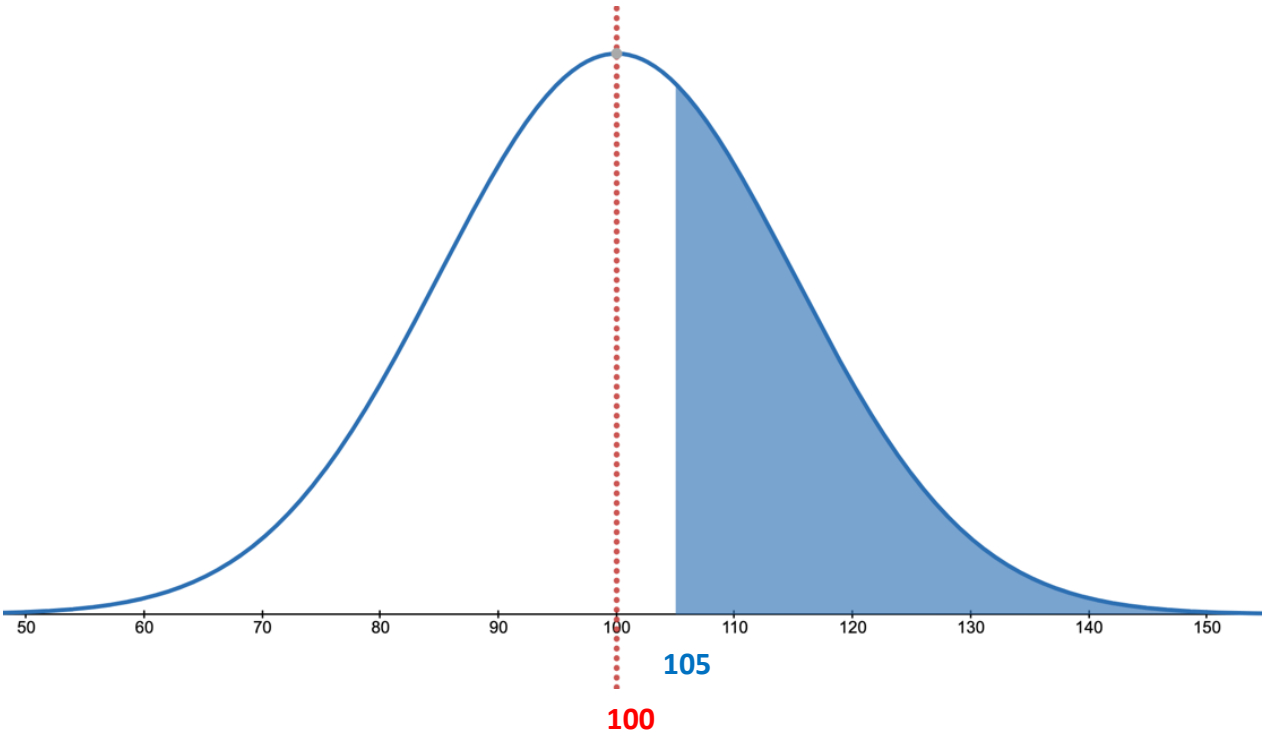
1. Less than 85? $x < 85$

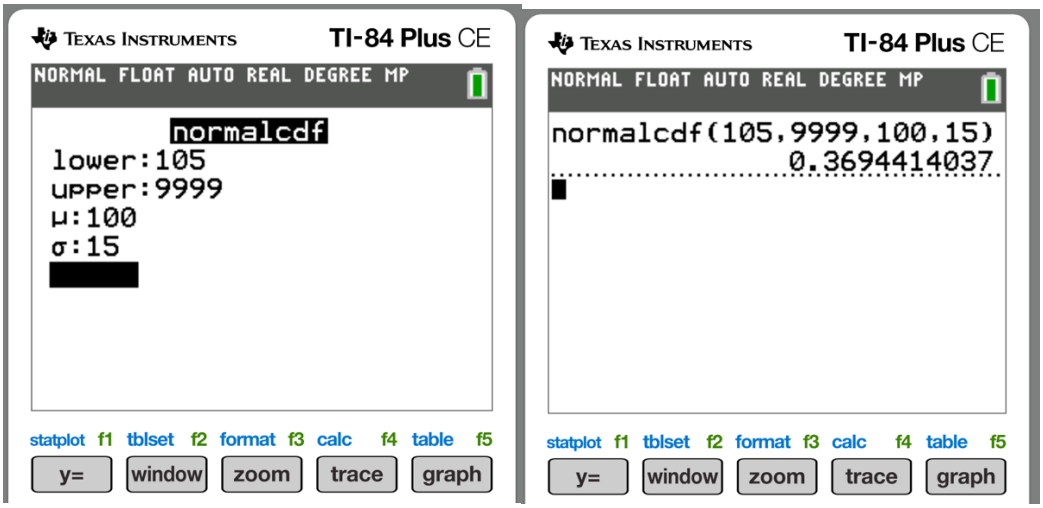




$$p(x < 85) \approx 0.159$$

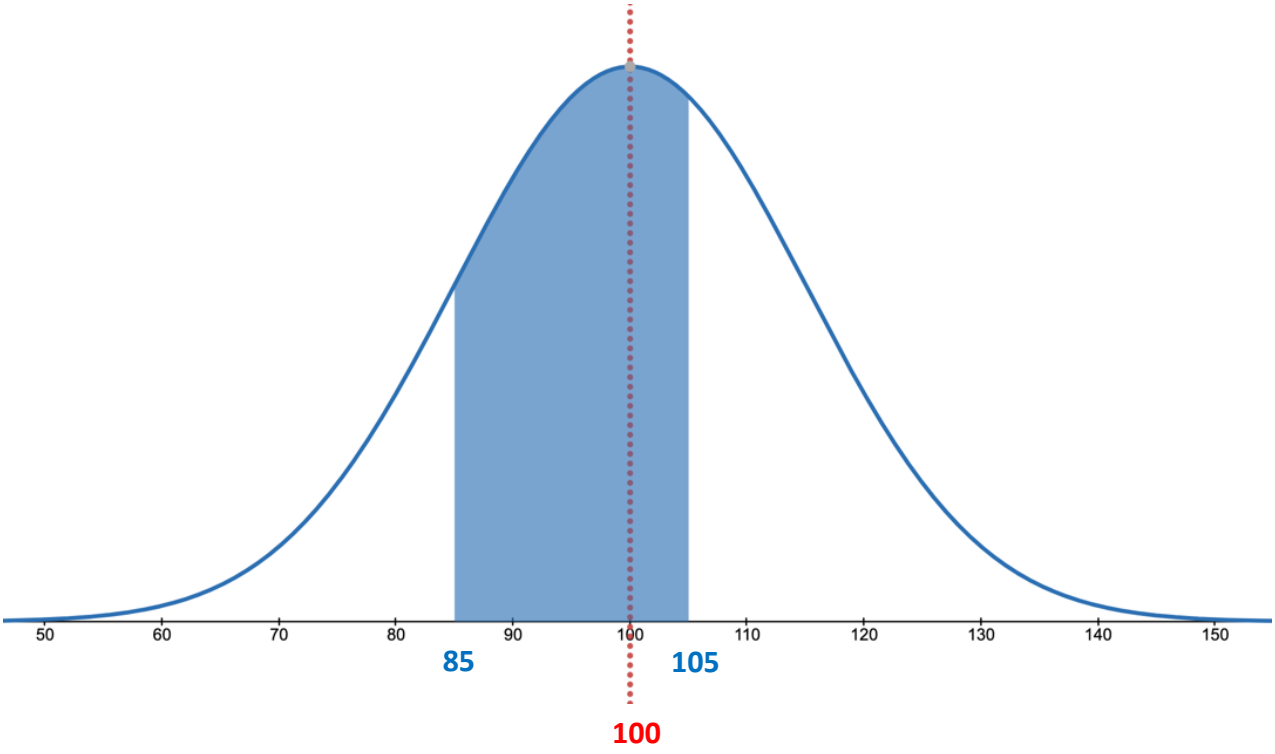
2. At least 105? $x \geq 105$

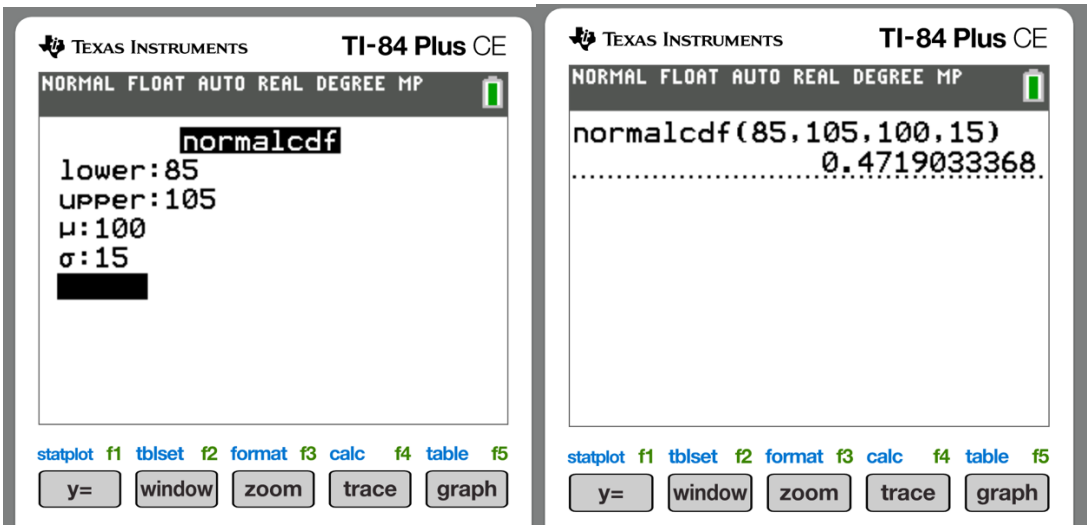




$p(x < 105) \approx 0.369$

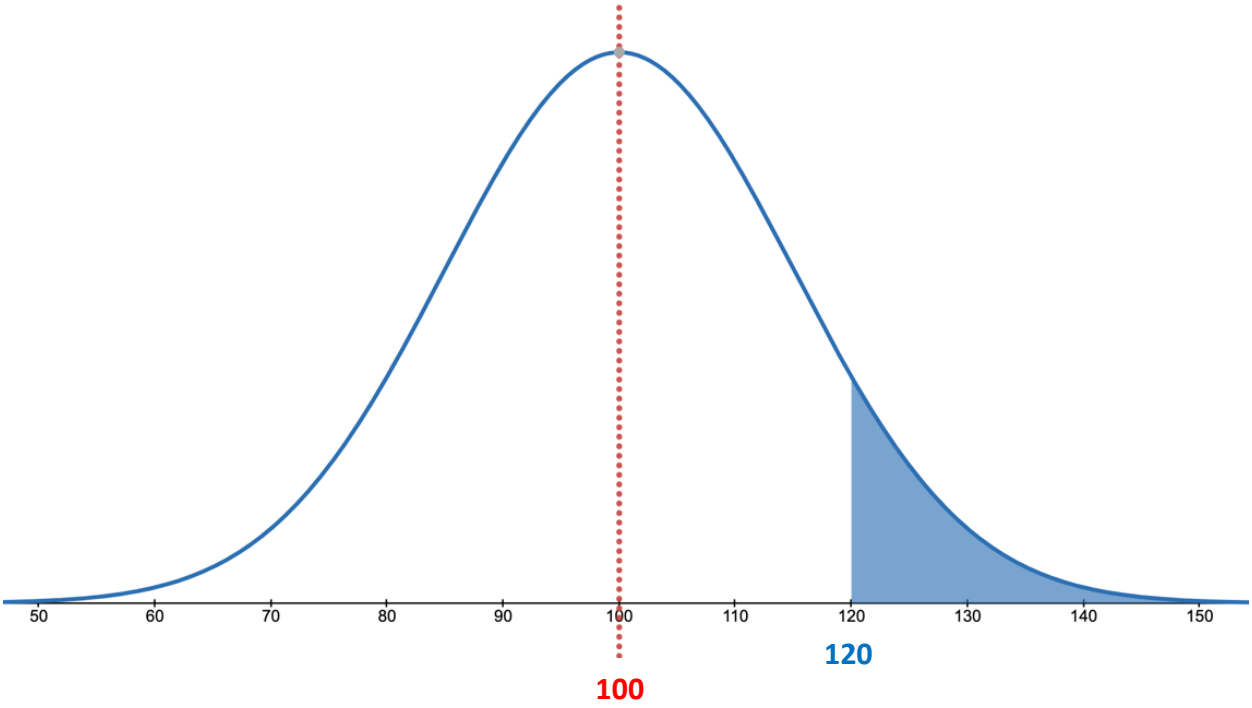
3. Between 85 and 105? $\mathbf{85 \leq x \leq 105}$

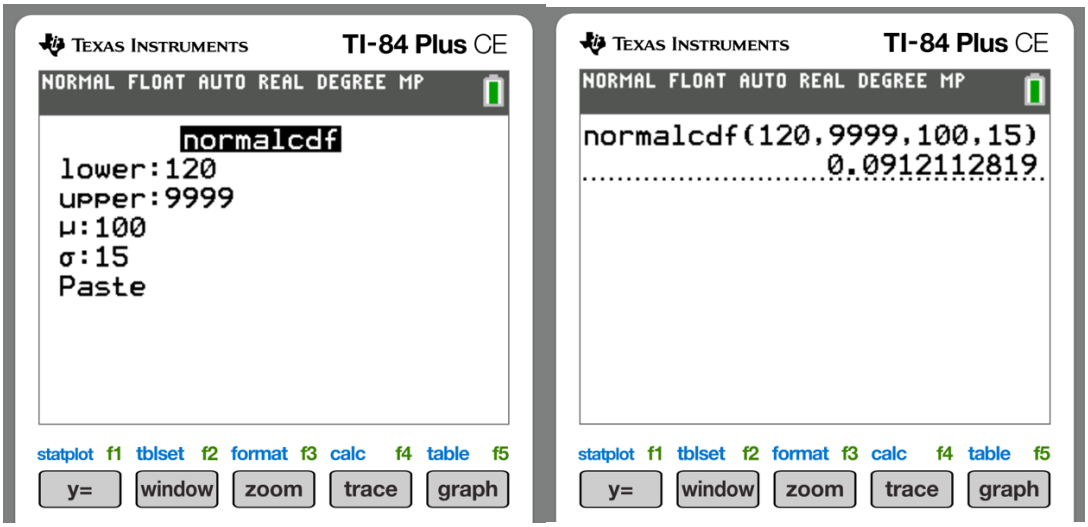




$$p(85 \leq x \leq 105) \approx 0.472$$

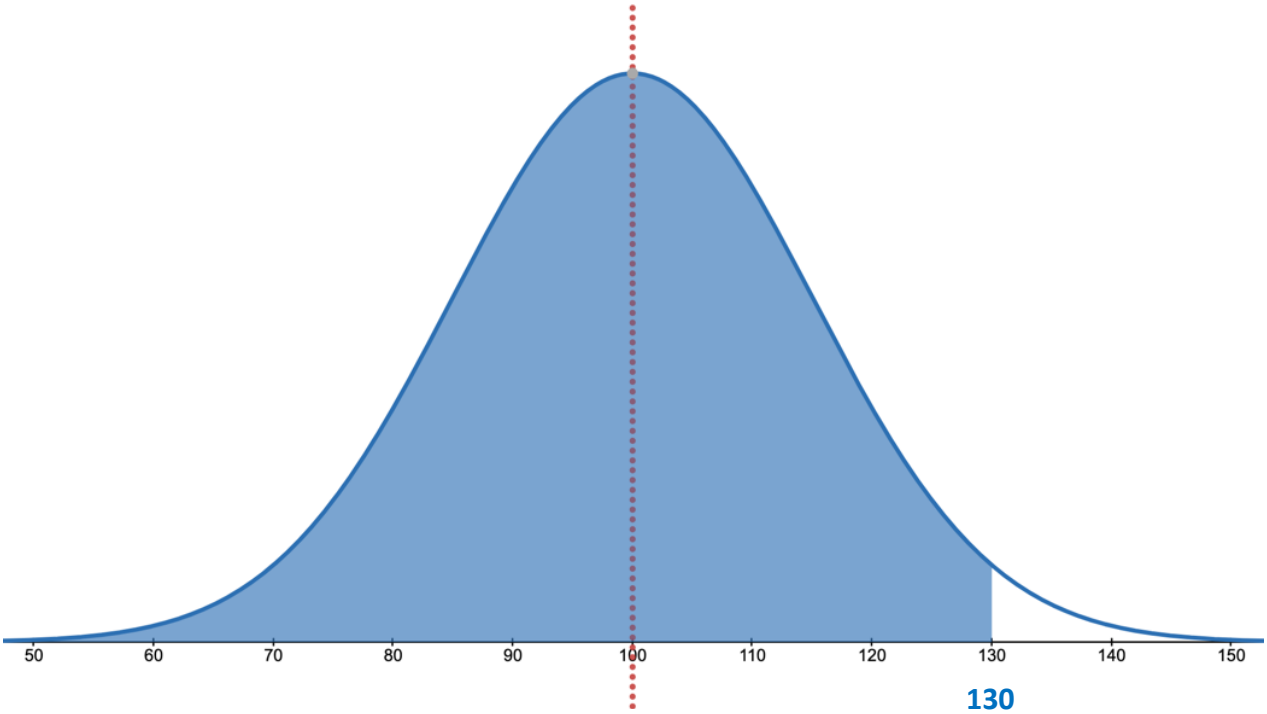
4. More than 120 $x > 120$

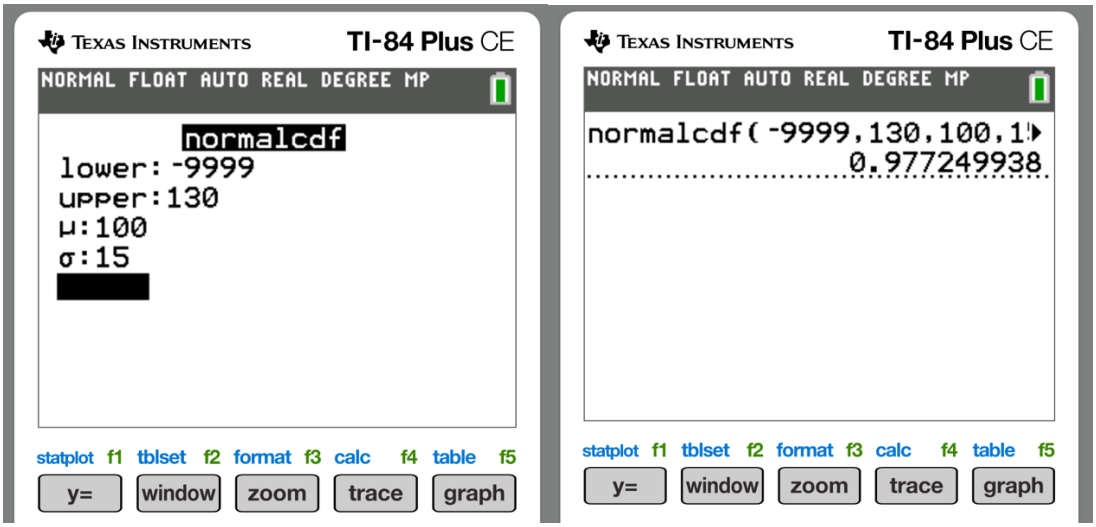




$p(x > 120) \approx 0.091$

5. No more than 130? $x \leq 130$

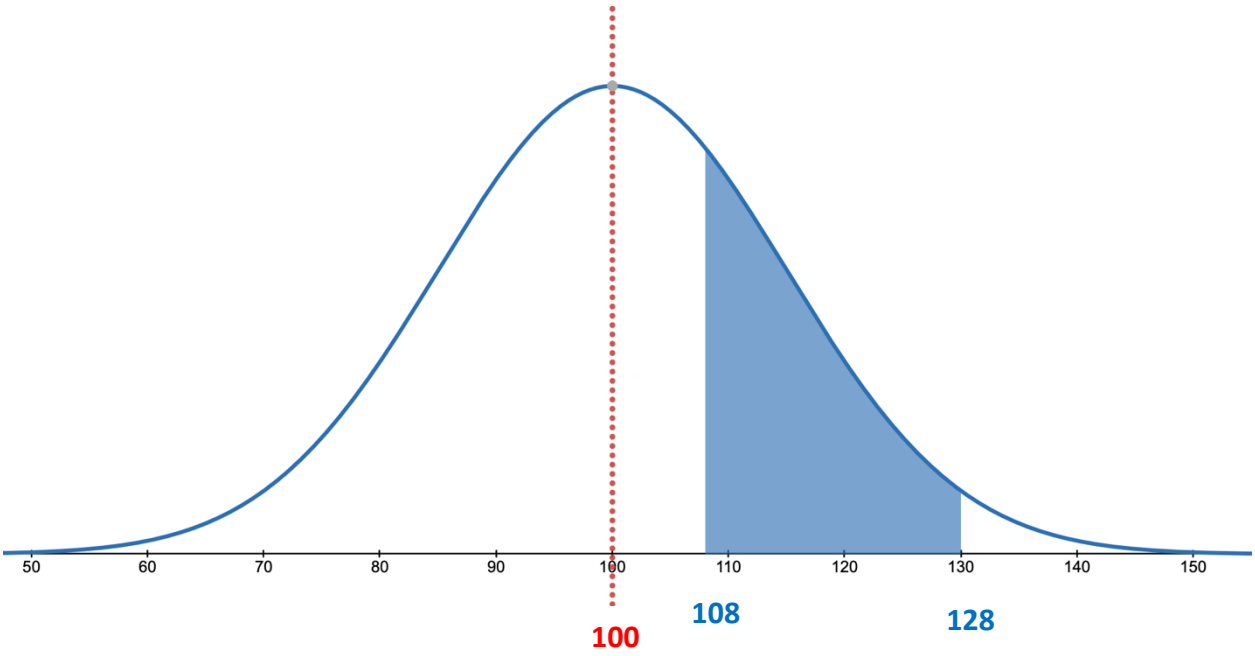


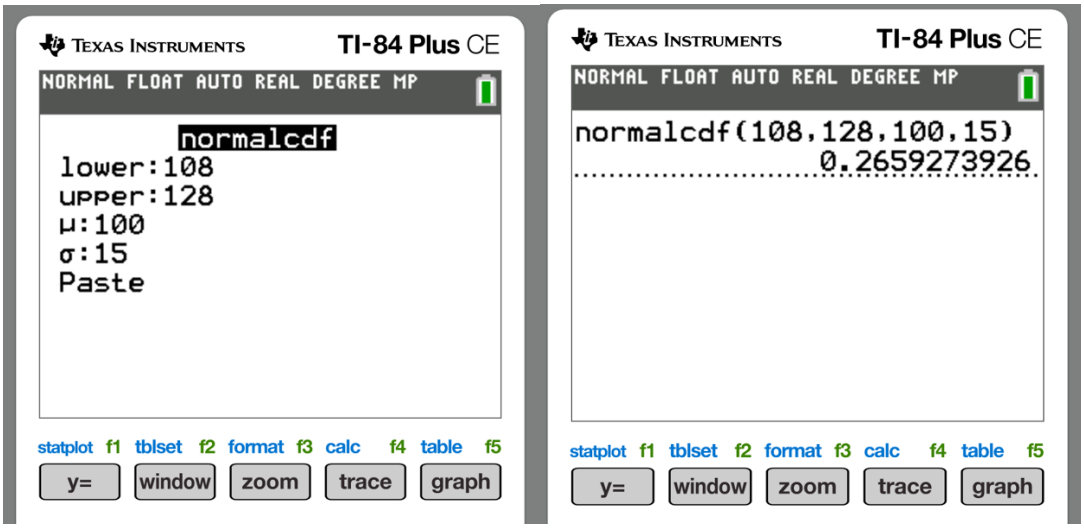


$p(x \leq 130) \approx 0.977$

Almost Certain

6. Between 108 and 128? $\mathbf{108 \leq x \leq 130}$





$$p(108 \geq x \leq 128) \approx 0.266$$

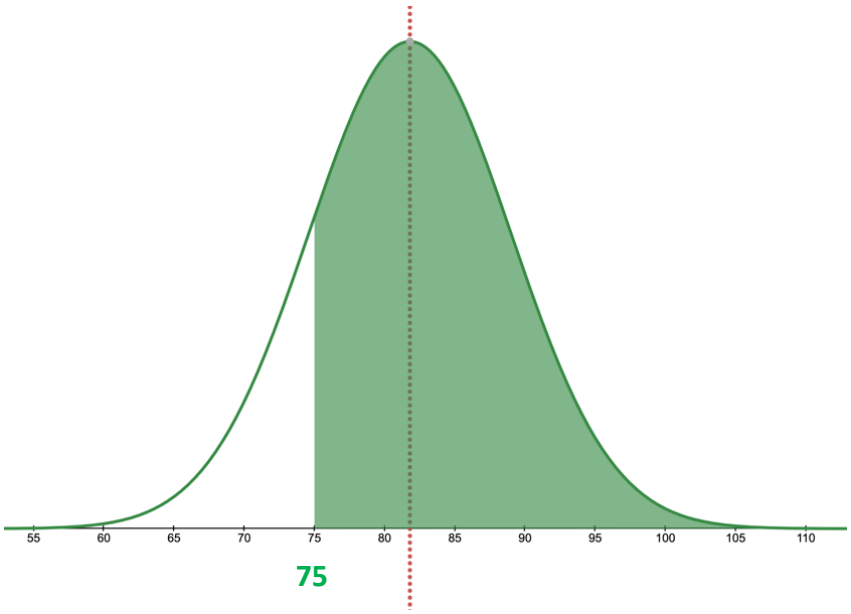
x

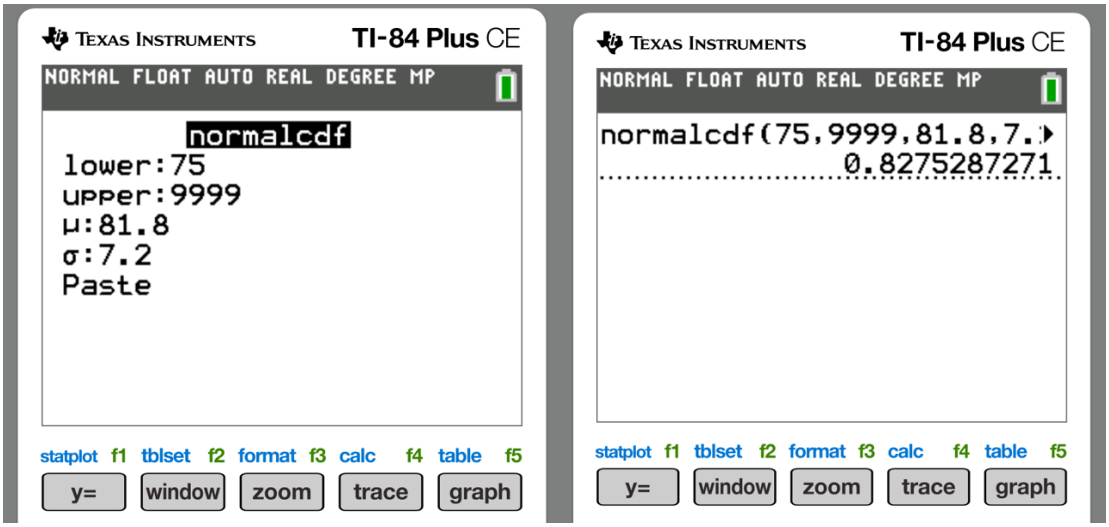
California Life Expectancy

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.

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

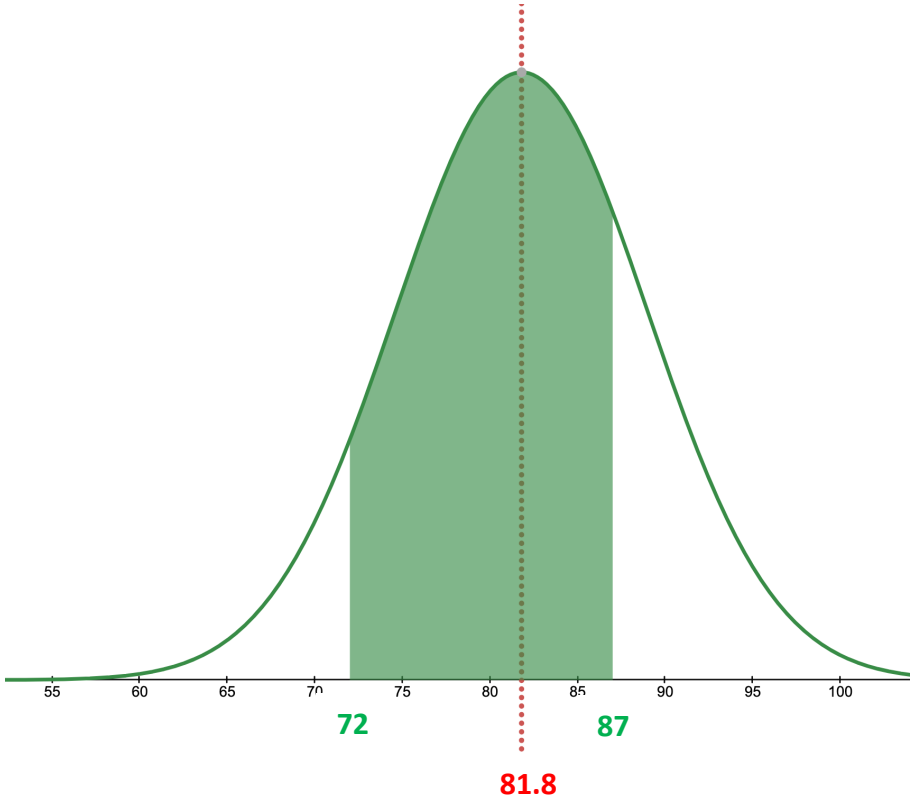
7. At least 75 years? $x \geq 75$

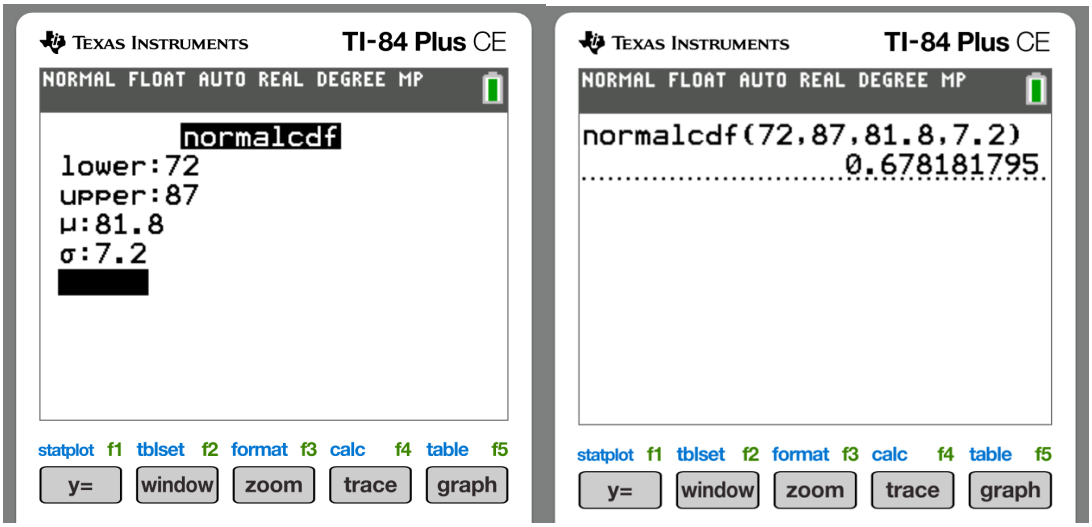




$$p(x \geq 75) \approx 0.828$$

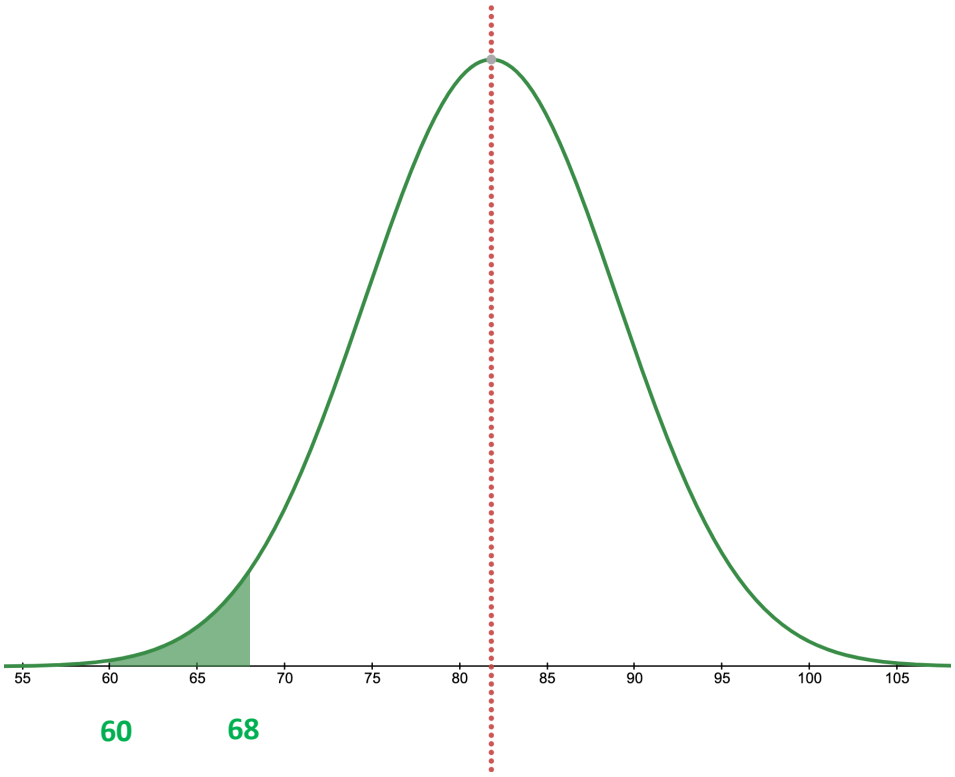
8. Between 72 and 87 years? $\mathbf{72 \leq x \leq 87}$

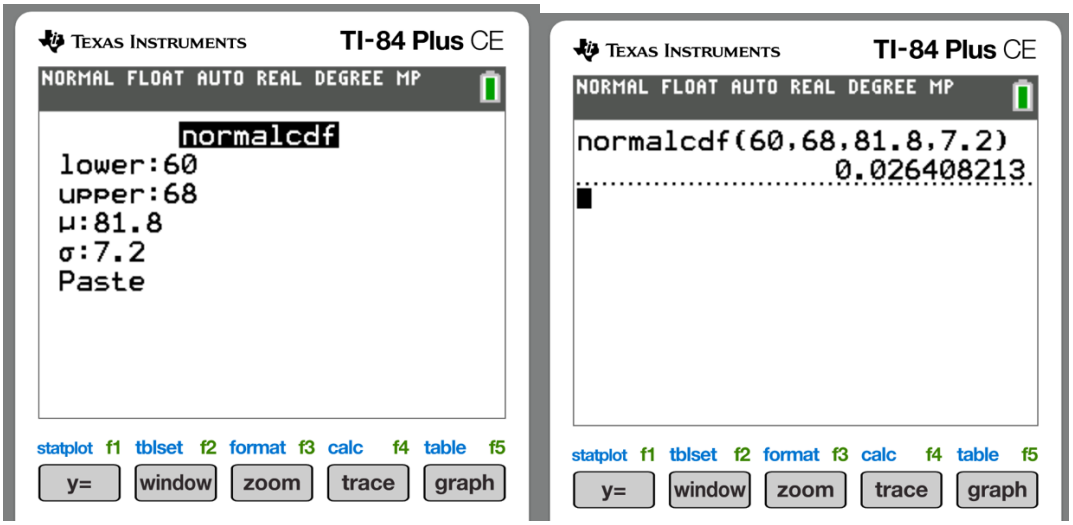




$$p(72 \leq x \leq 87) \approx 0.678$$

9. Between 60 and 68 years? $60 \leq x \leq 68$

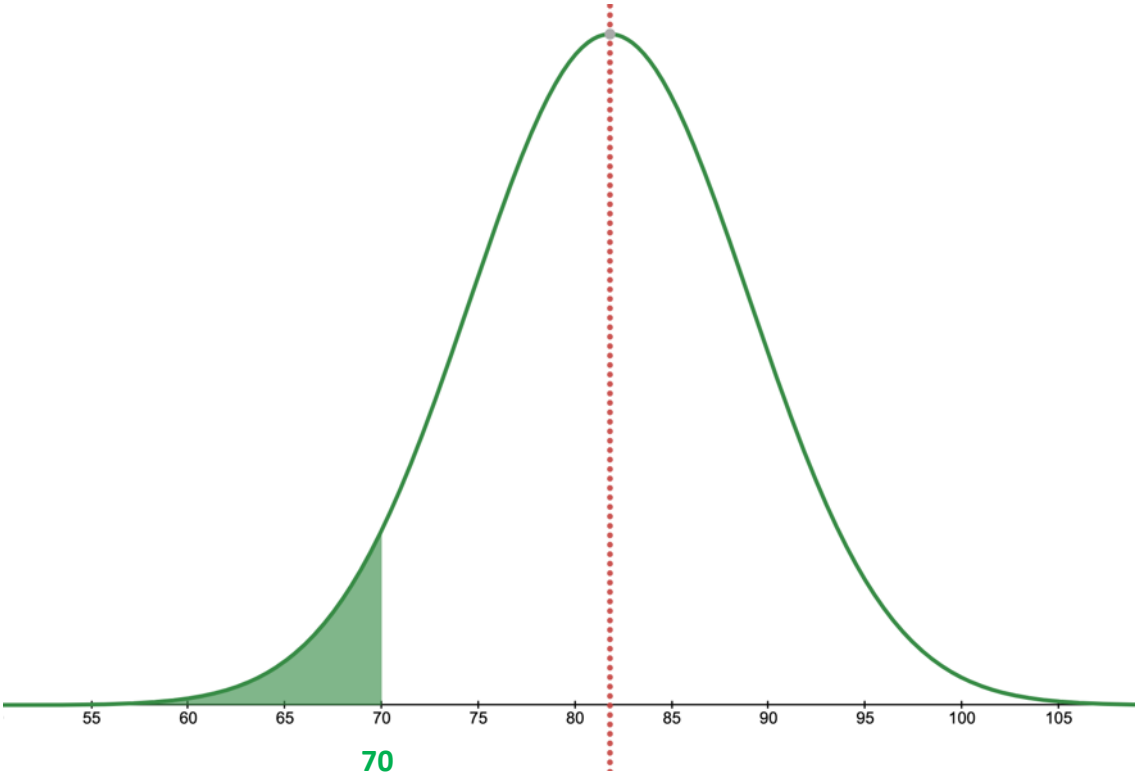


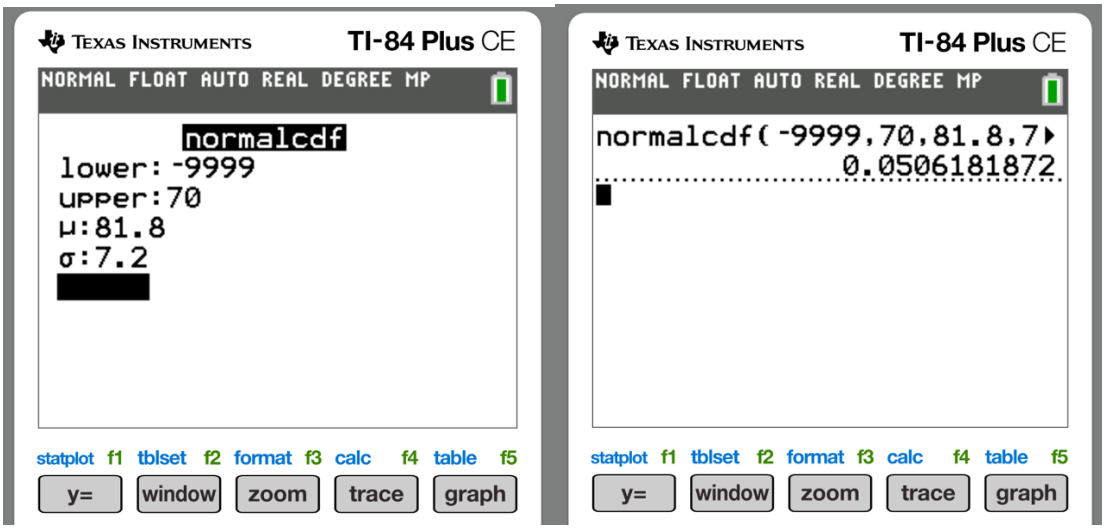


$p(60 \leq x \leq 68) \approx 0.026$

Not Likely

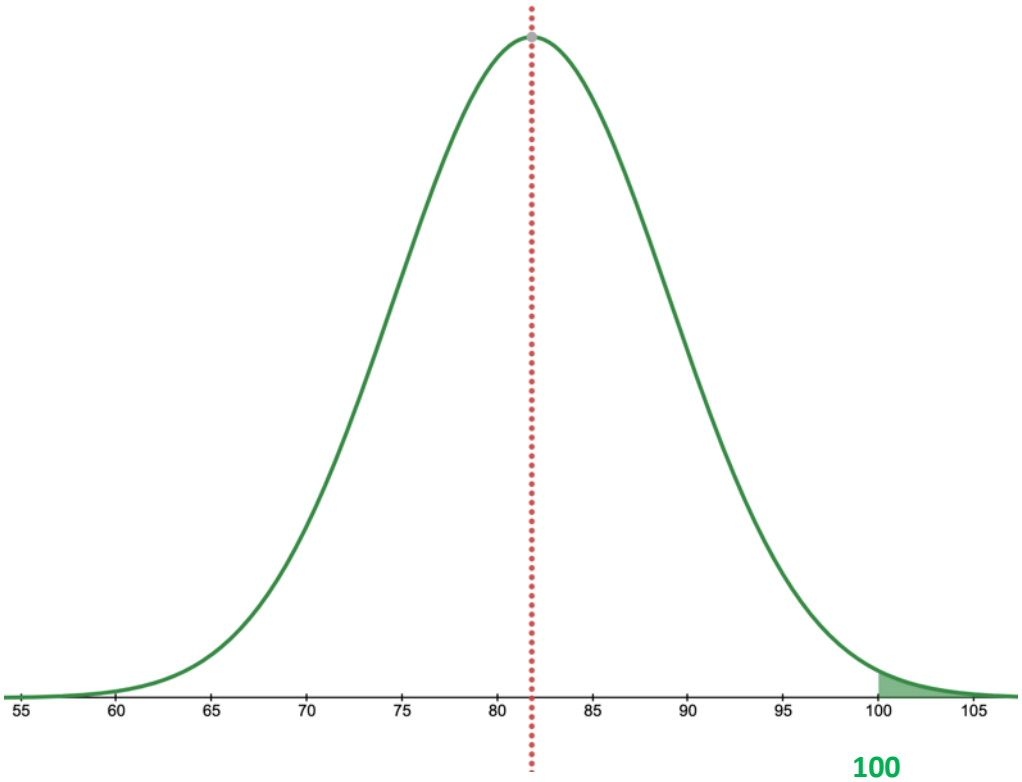
10. Less than 70 years? $x < 70$

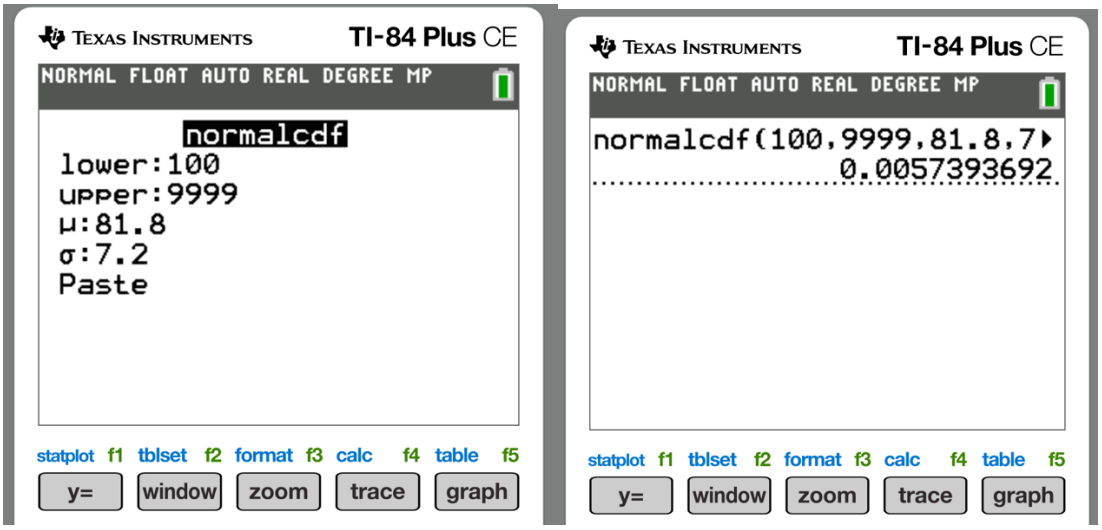




$p(x < 70) \approx 0.051$

11. More than 100 years? $x > 100$

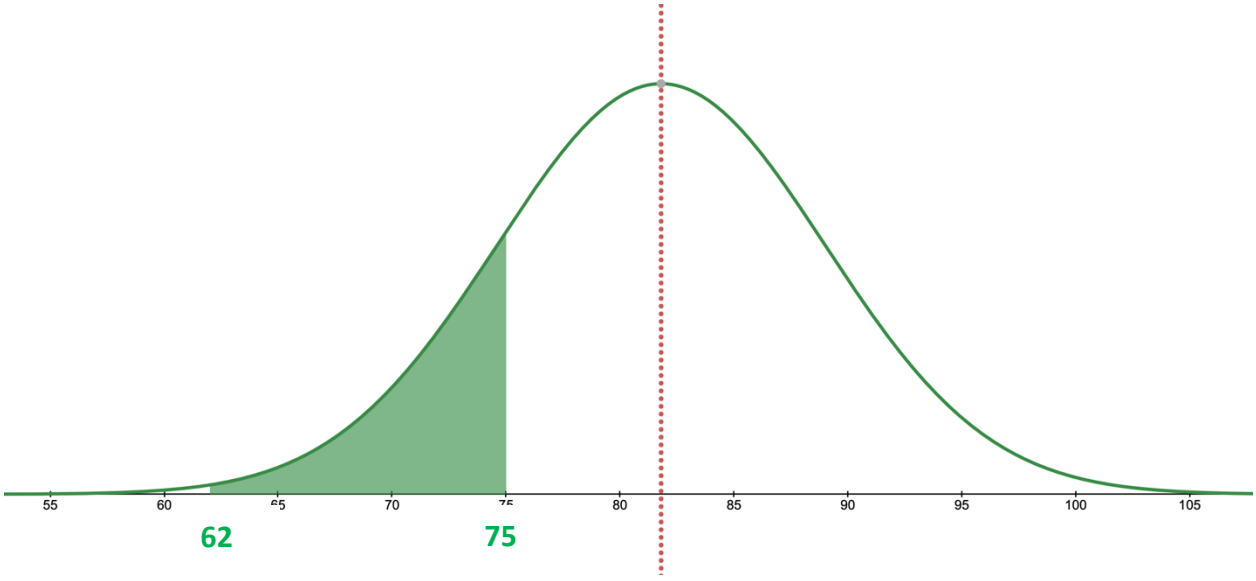


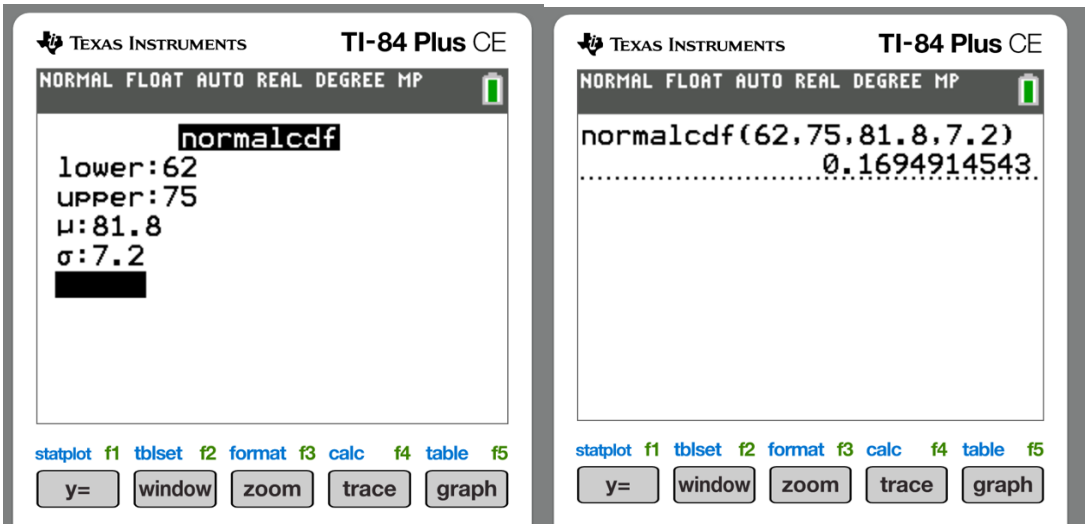


$p(x > 100) \approx 0.006$

Not Likely

12. Between 62 and 75 years?





$$p(x > 100) \approx 0.169$$

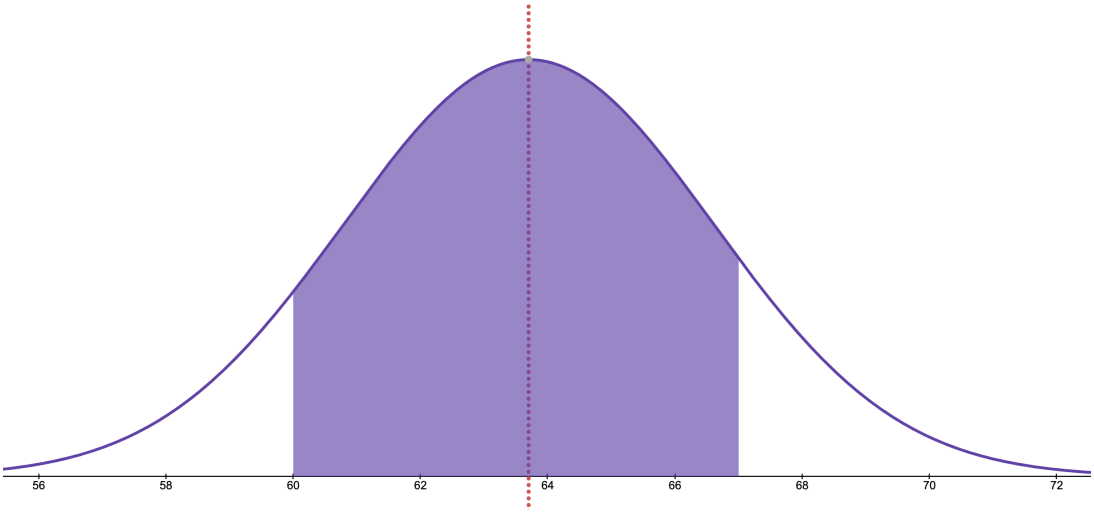
Height of Women

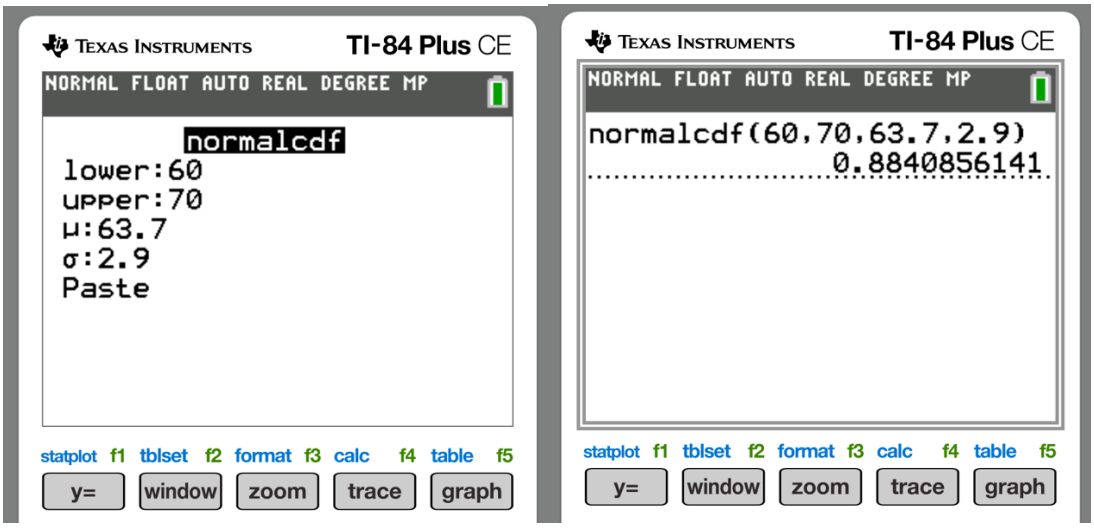
The height of women is normally distributed with a mean of 63.7 inches and a standard deviation of 2.9 inches. If you select a woman at random, what's the probability a woman will be:

Approximate your answers to the nearest thousandths.

$$x = \text{Height of Women } \mu = 63.7,\ \sigma = 2.9$$

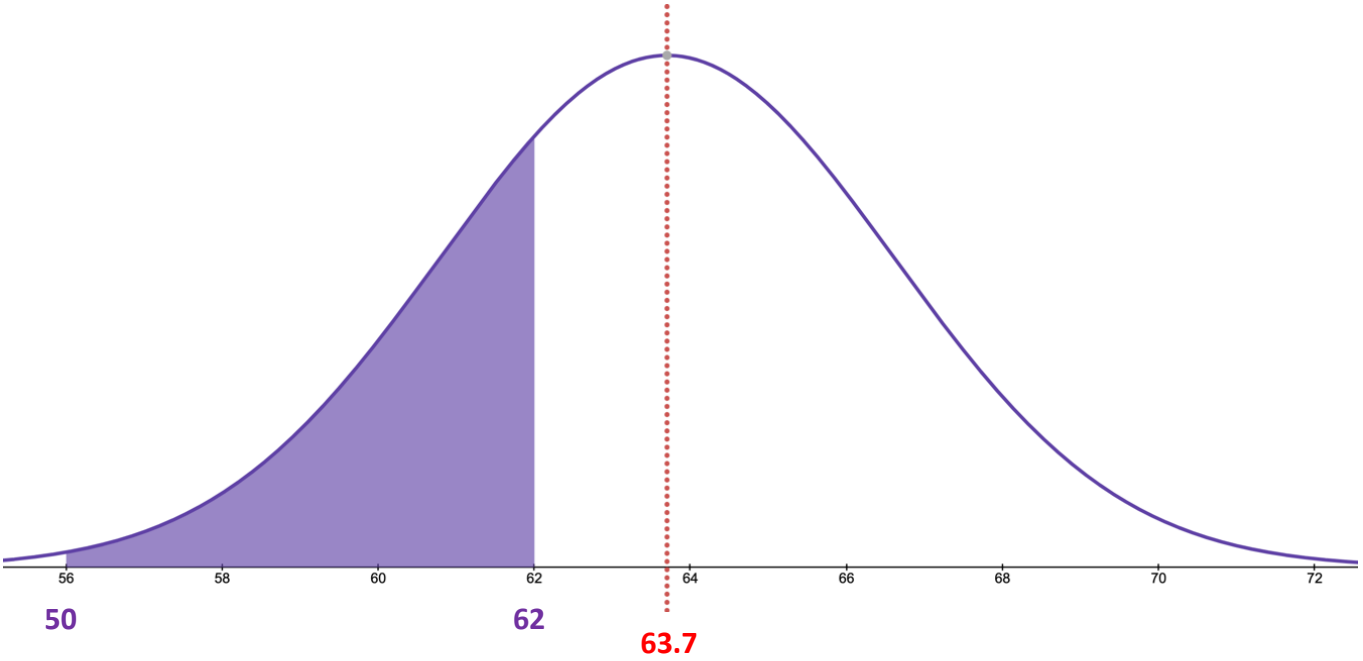
13. Between 60 and 70 inches? $60 \le x \le 70$

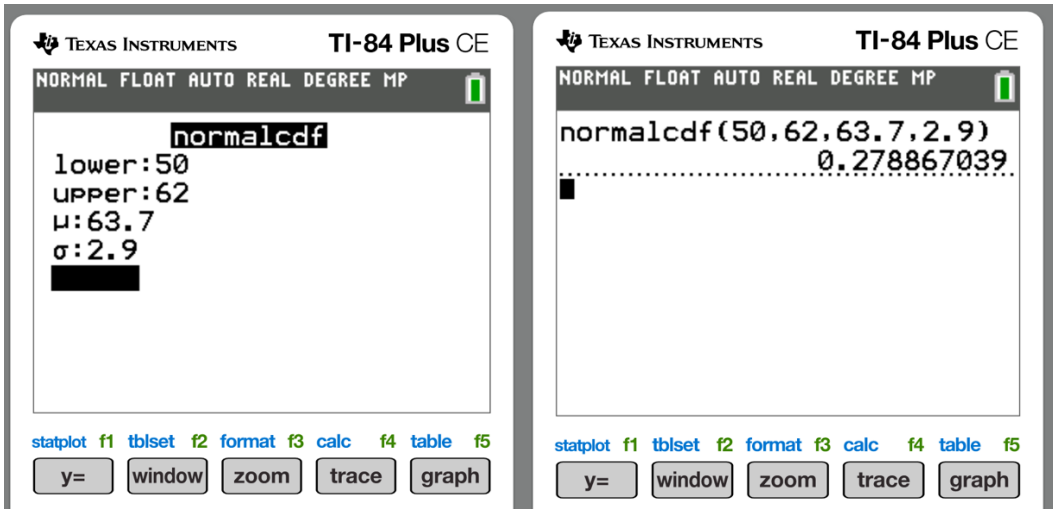




$$p(60 \le x \le 70) \approx 0.884$$

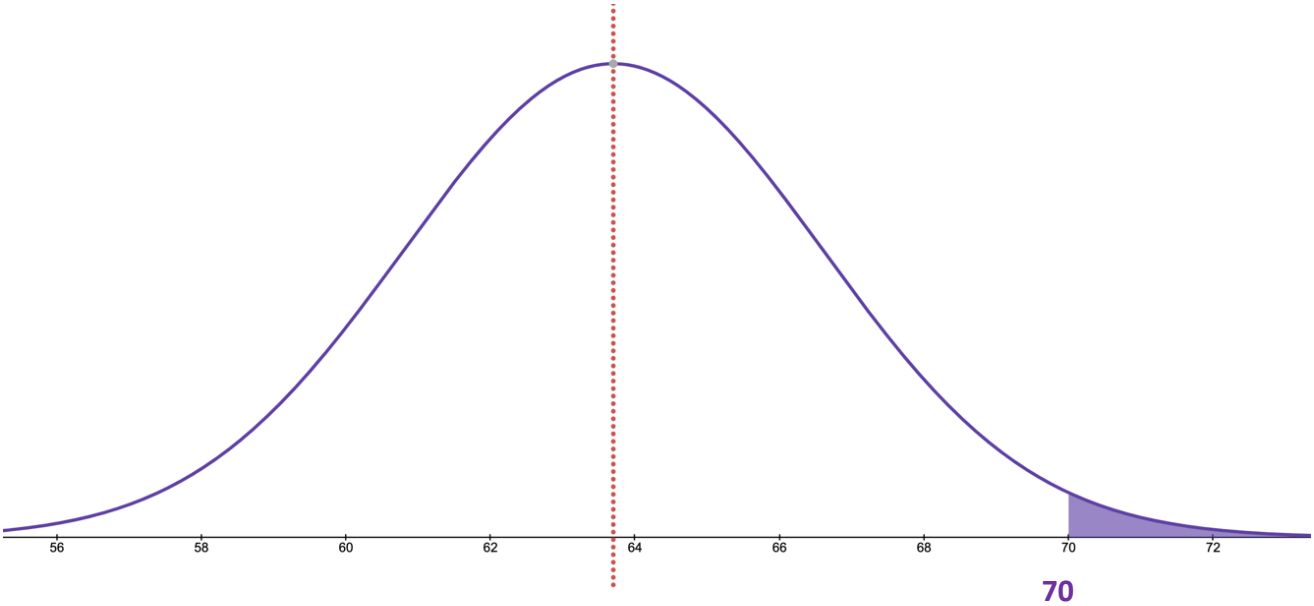
14. Between 50 and 62 inches? $\mathbf{50 \leq x \leq 62}$





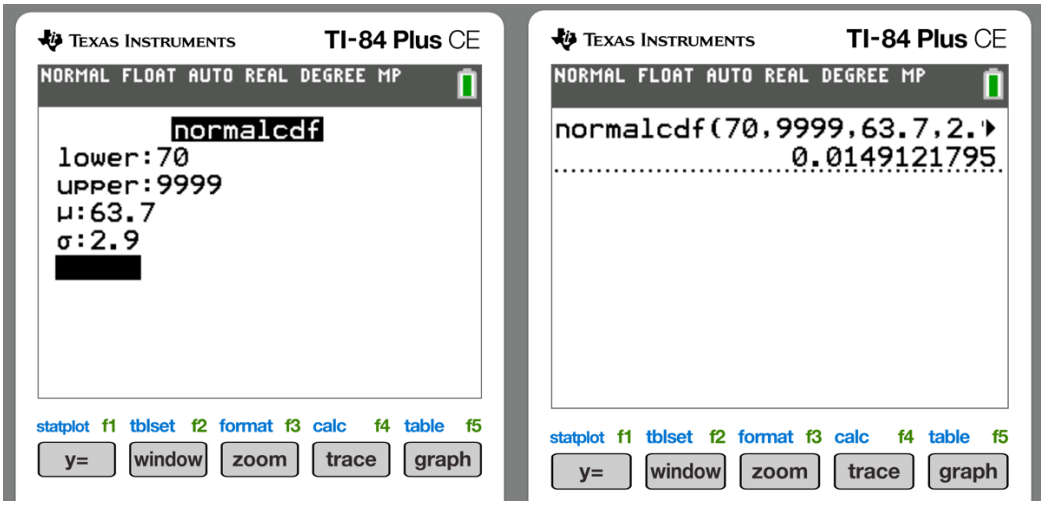
$$p(\mathbf{50 \leq x \leq 62}) \approx \mathbf{0.279}$$

15. At least 70 inches? $x \geq 70$



70

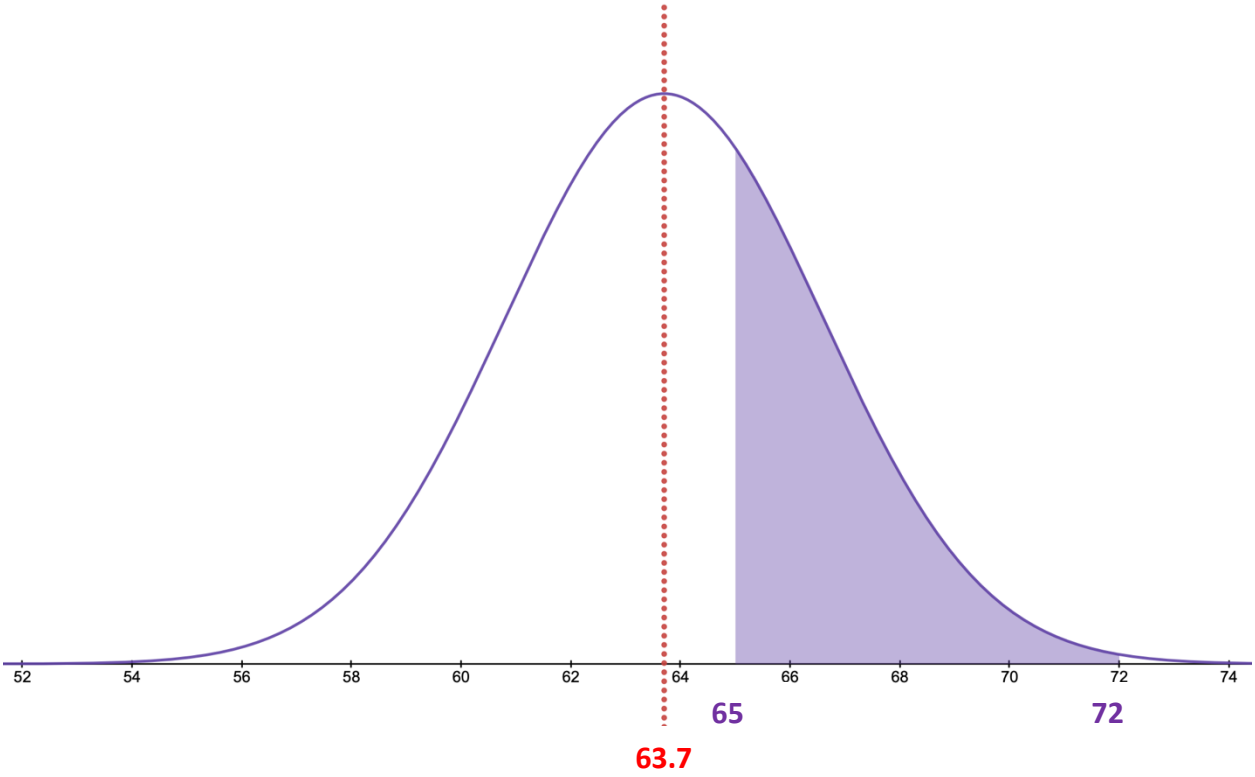
63.7

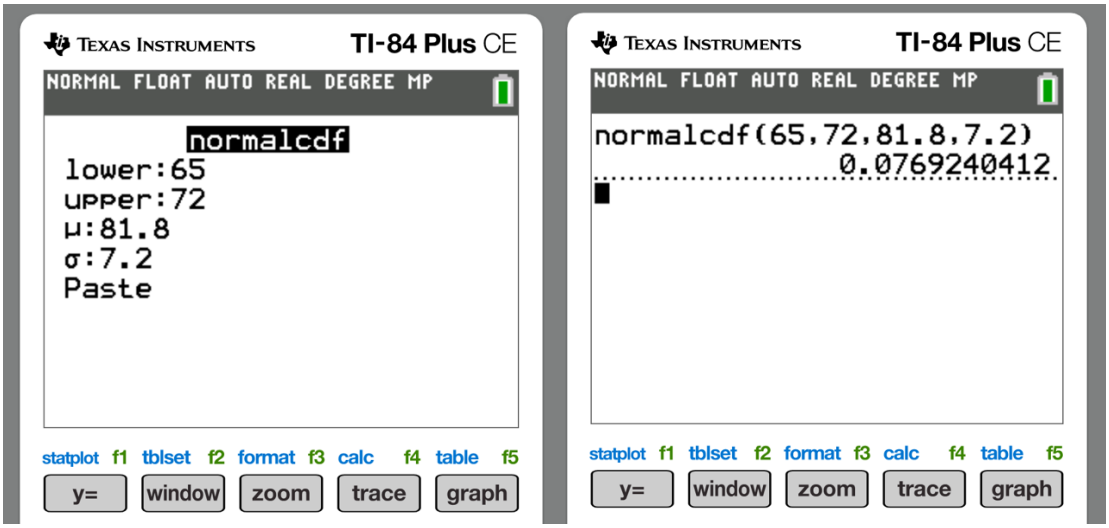


$p(x \geq 70) \approx 0.015$

Not Likely

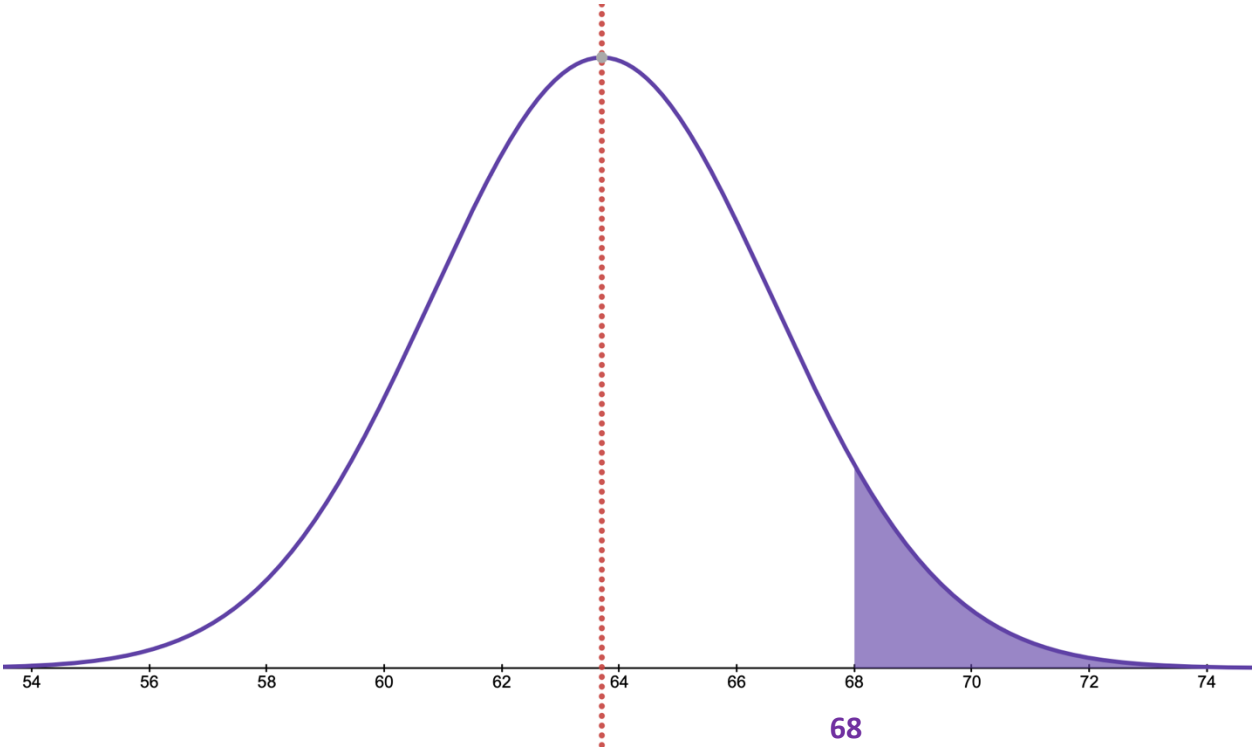
16. Between 65 inches and 72 inches?

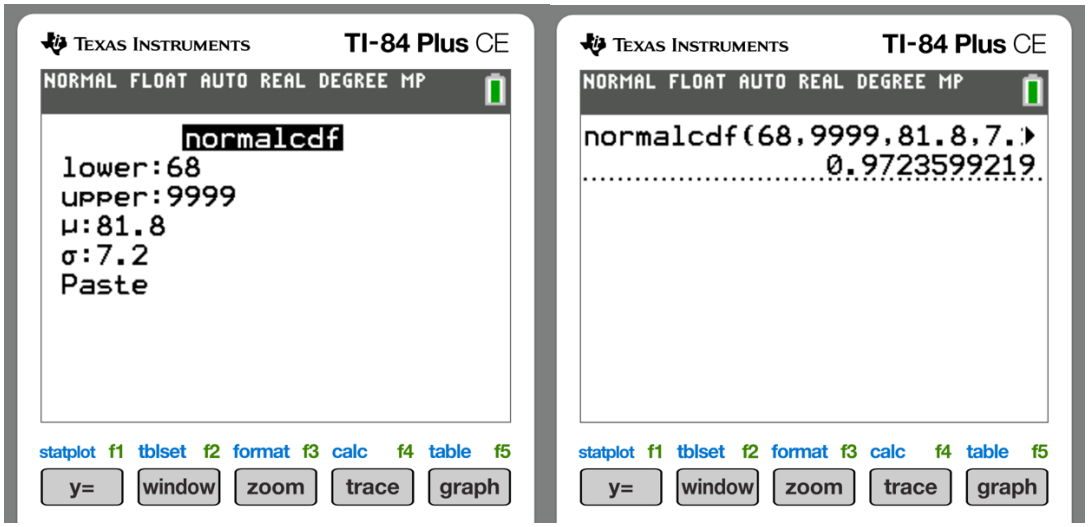




$$p(65 \leq x \leq 72) \approx 0.077$$

17. More than 68 inches?

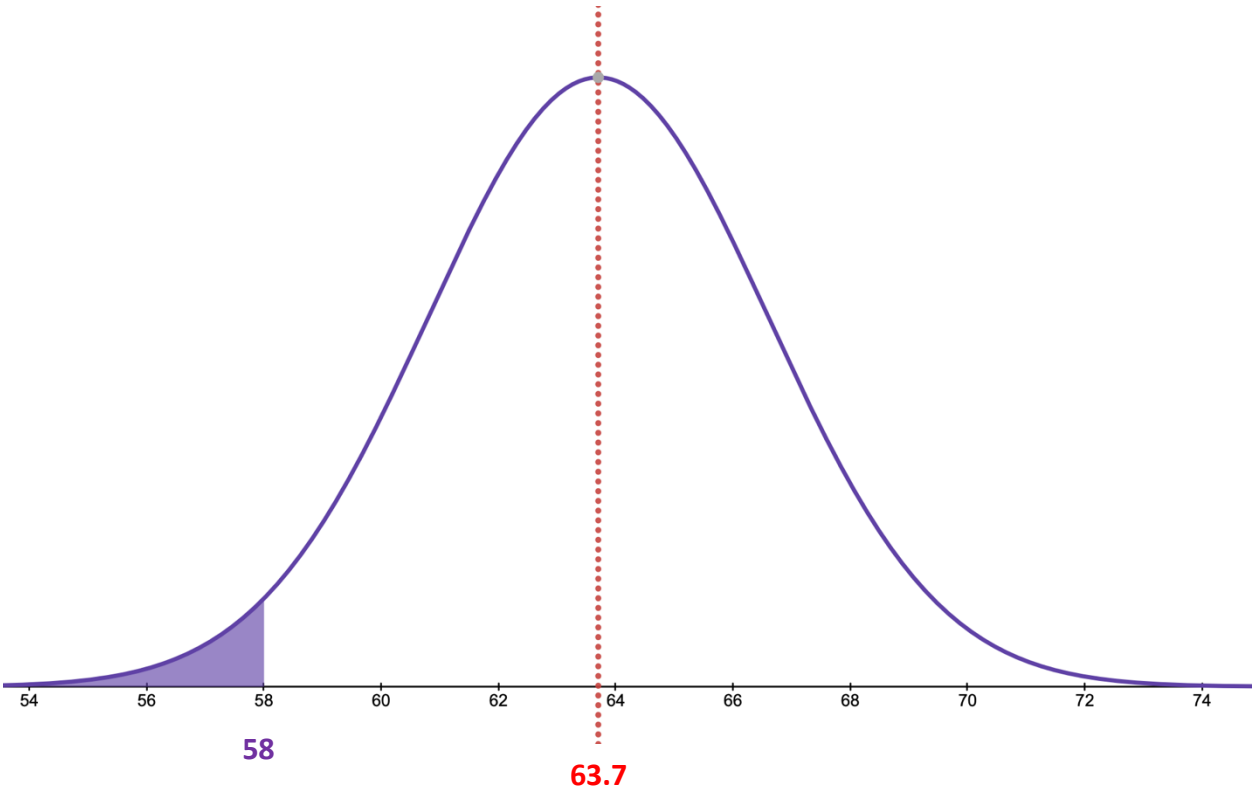


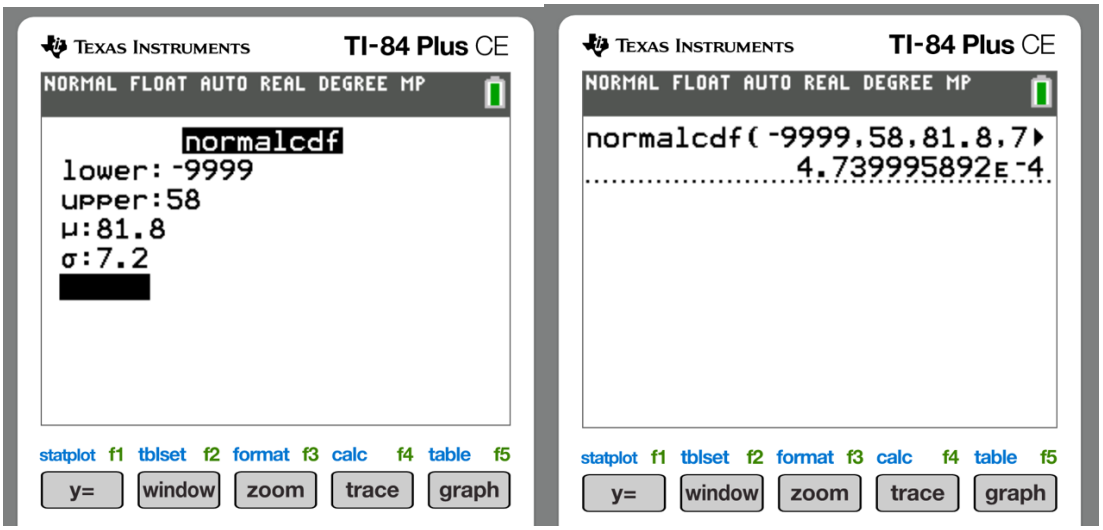


$$p(x > 68) \approx 0.972$$

Almost Certain

18. No more than 58 inches?





$$p(x \leq 58) \approx 0.000$$

Not Likely

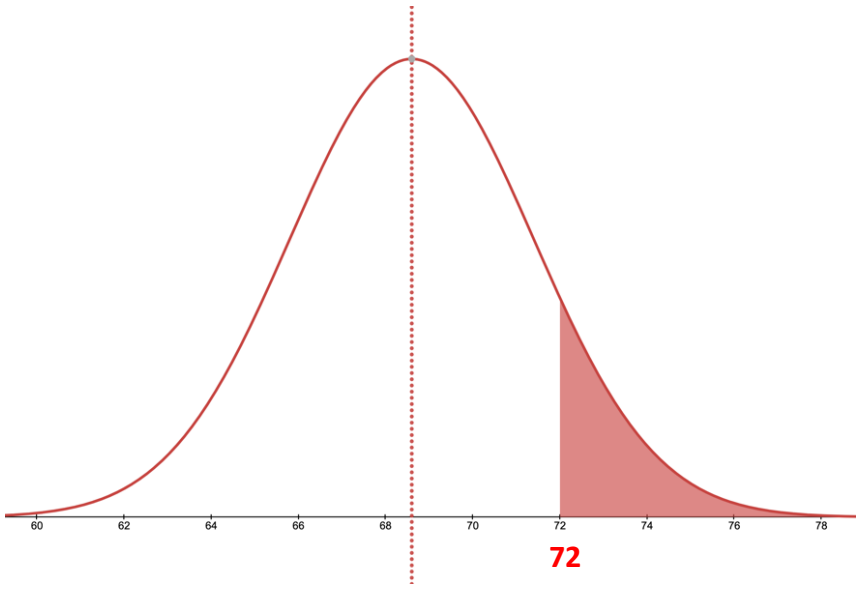
Height of Men

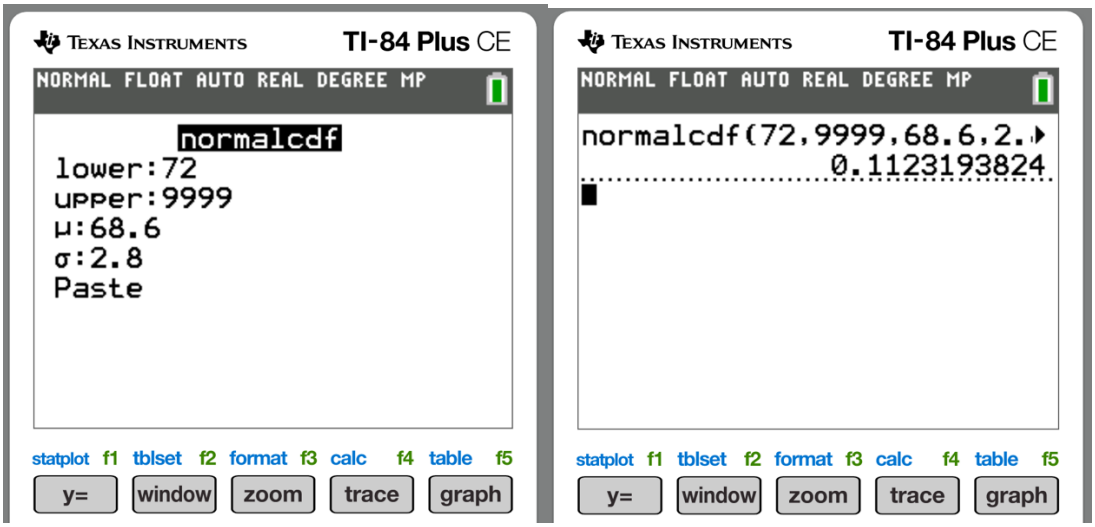
The height of women is normally distributed with a mean of 68.6 inches and a standard deviation of 2.8 inches. If you select a man at random, what's the probability the man will be:

Approximate your answers to the nearest thousandths.

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

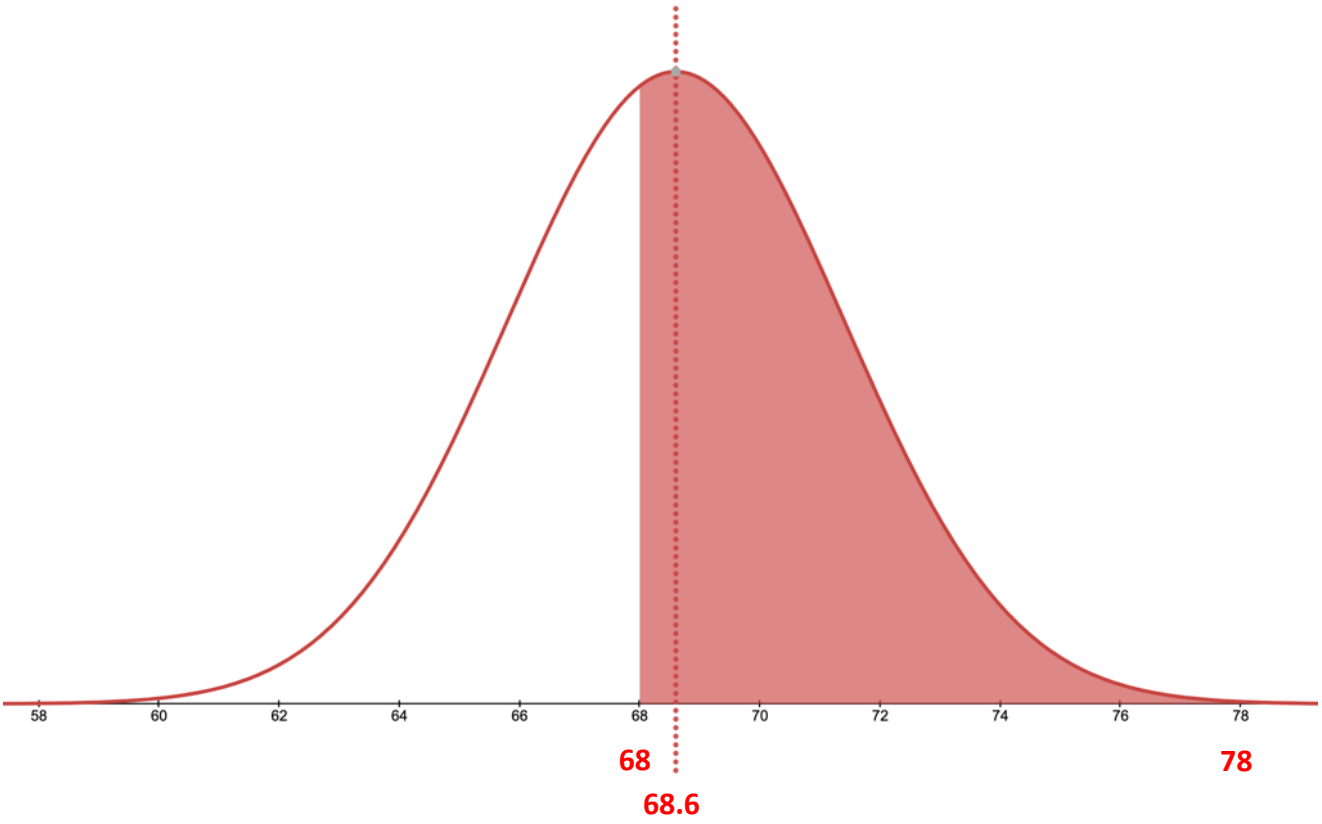
19. More than 72 inches? $x > 72$

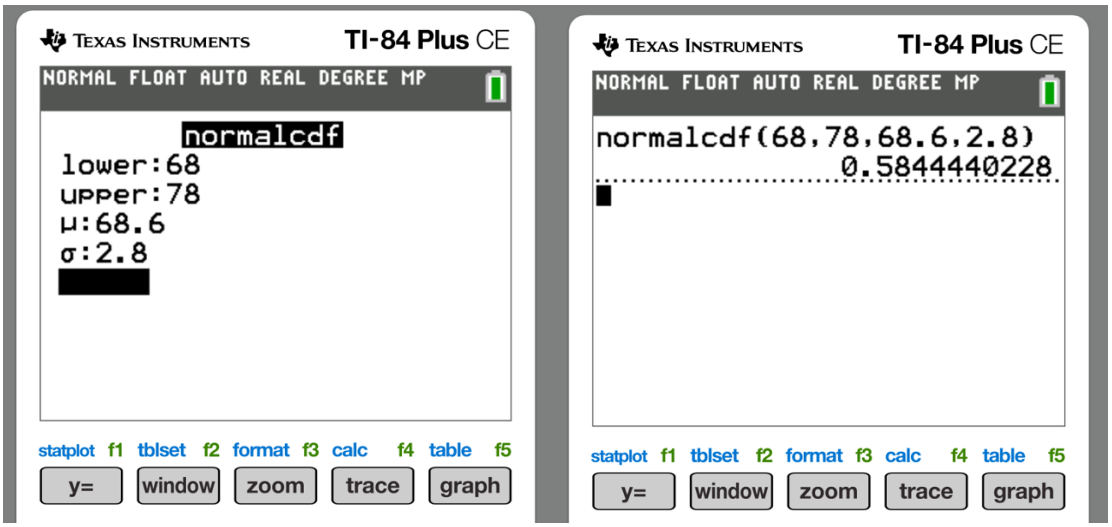




$$p(x > 72) \approx 0.112$$

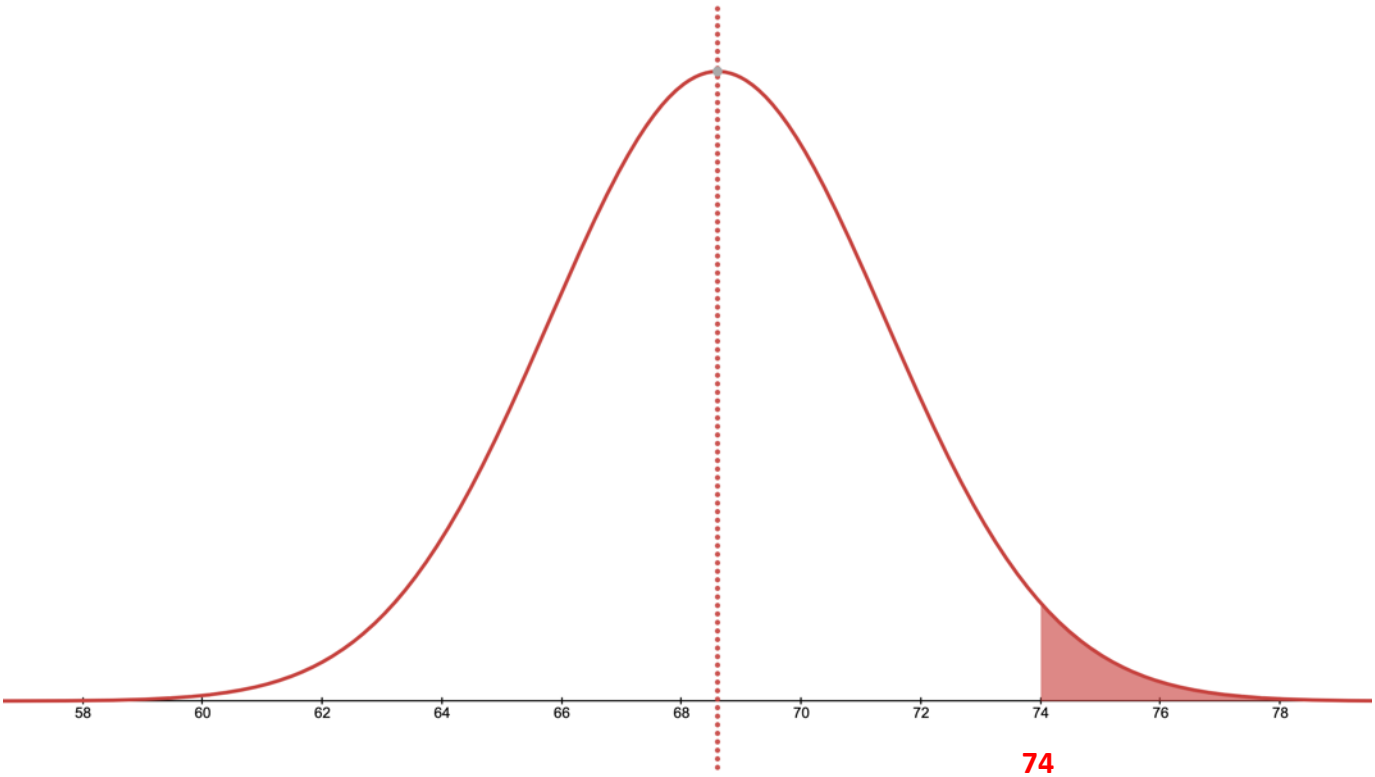
20. Between 68 and 78 inches? $\mathbf{68 \leq x \leq 78}$





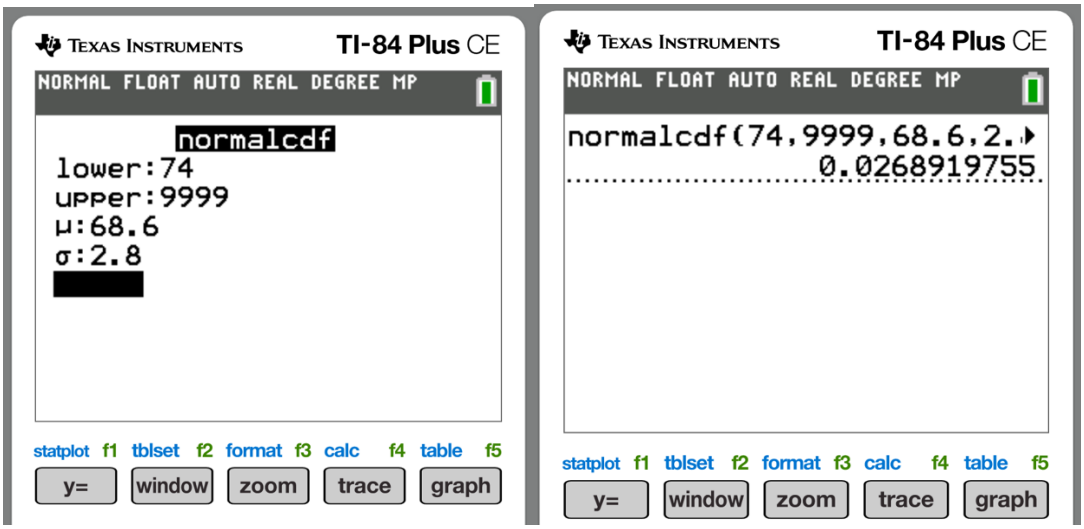
$$\mathbf{p(68 \leq x \leq 78) \approx 0.584}$$

21. At least 74 inches? $x \geq 74$



74

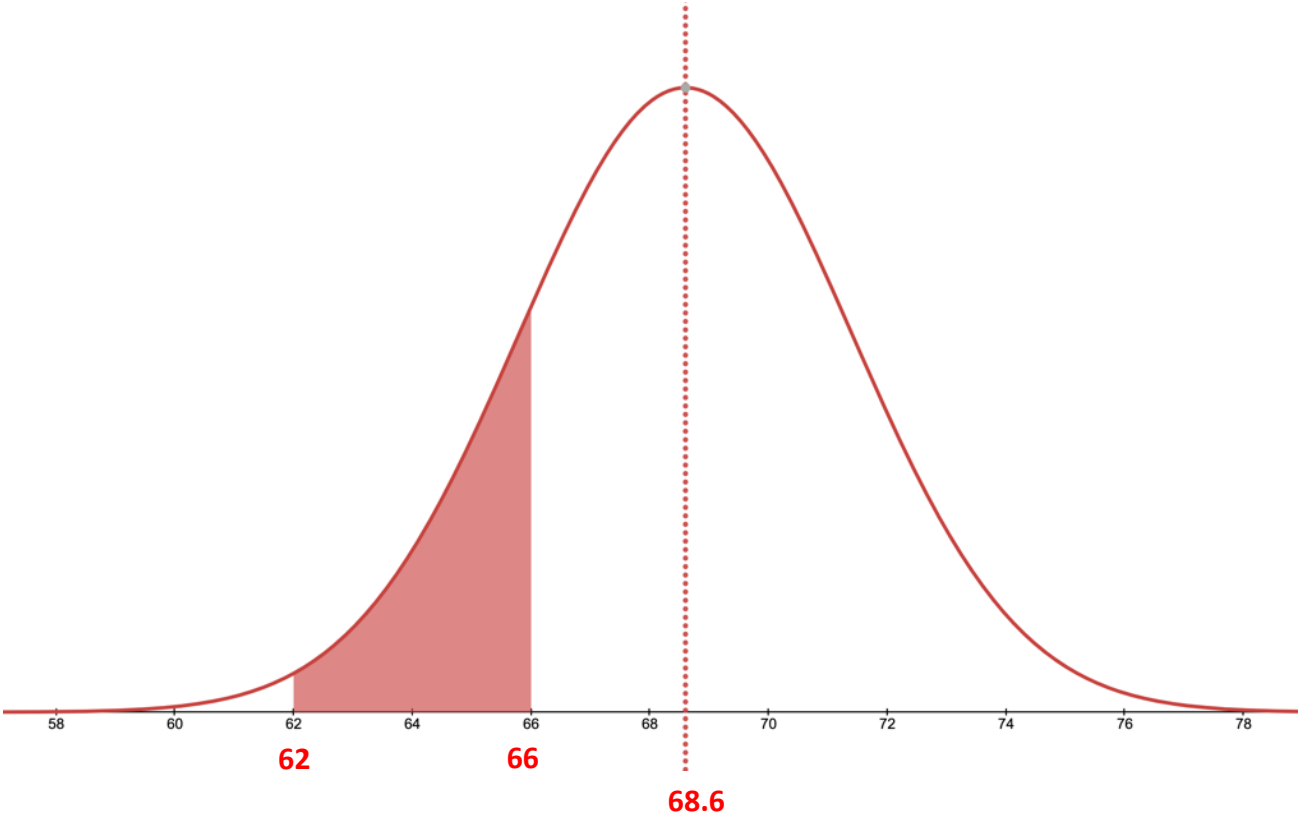
68.6

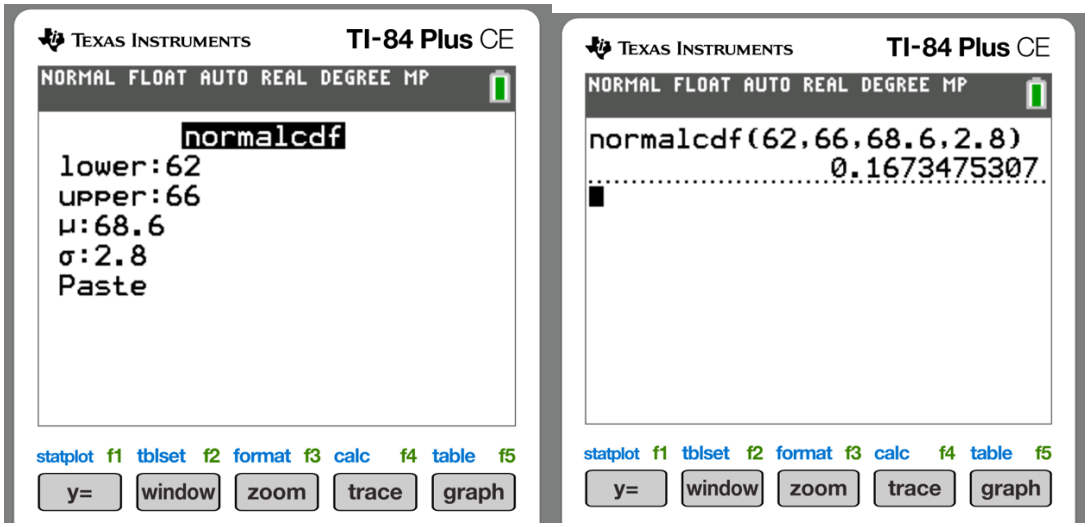


$p(x \geq 74) \approx 0.027$

Not Likely

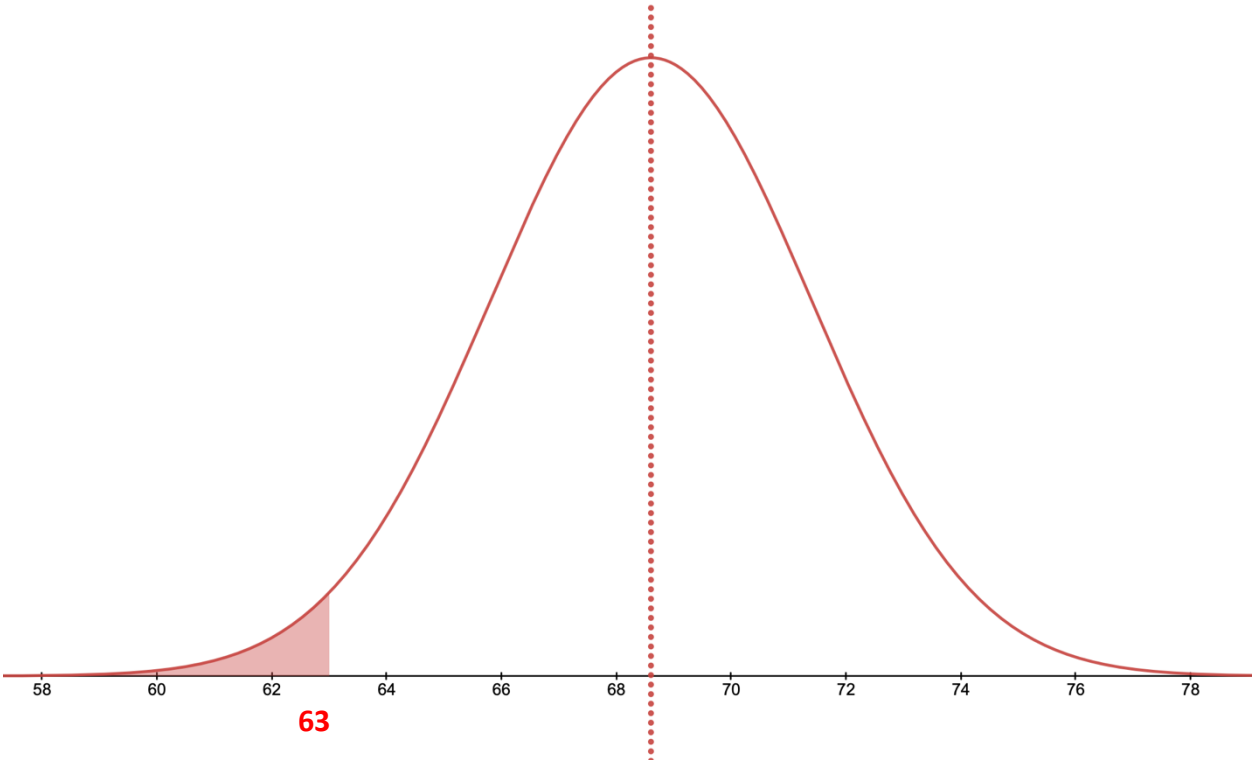
22. Between 62 and 66 inches? $\mathbf{62 \leq x \leq 66}$

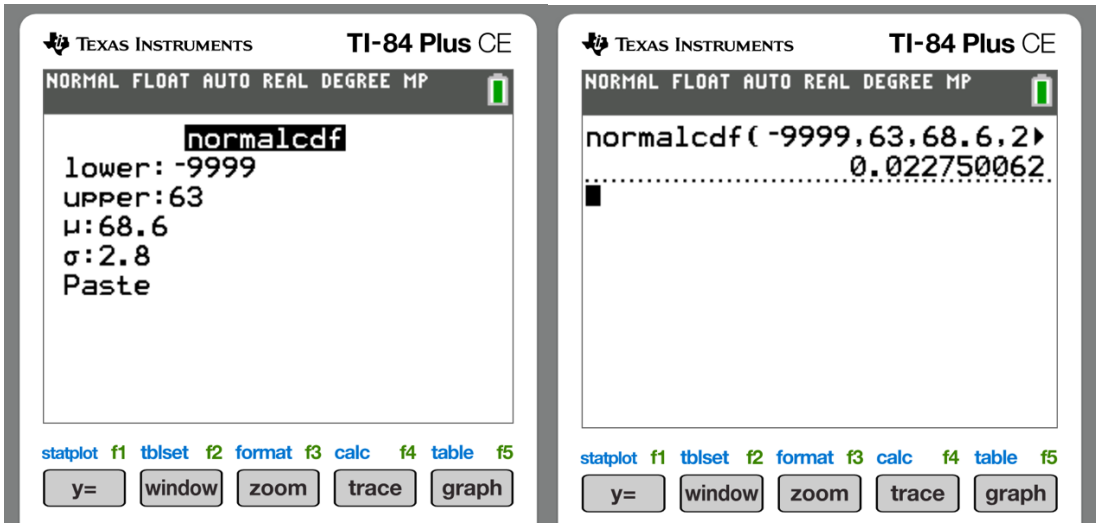




$\mathbf{p(62 \leq x \leq 66) \approx 0.167}$

23. Less than 63 inches?

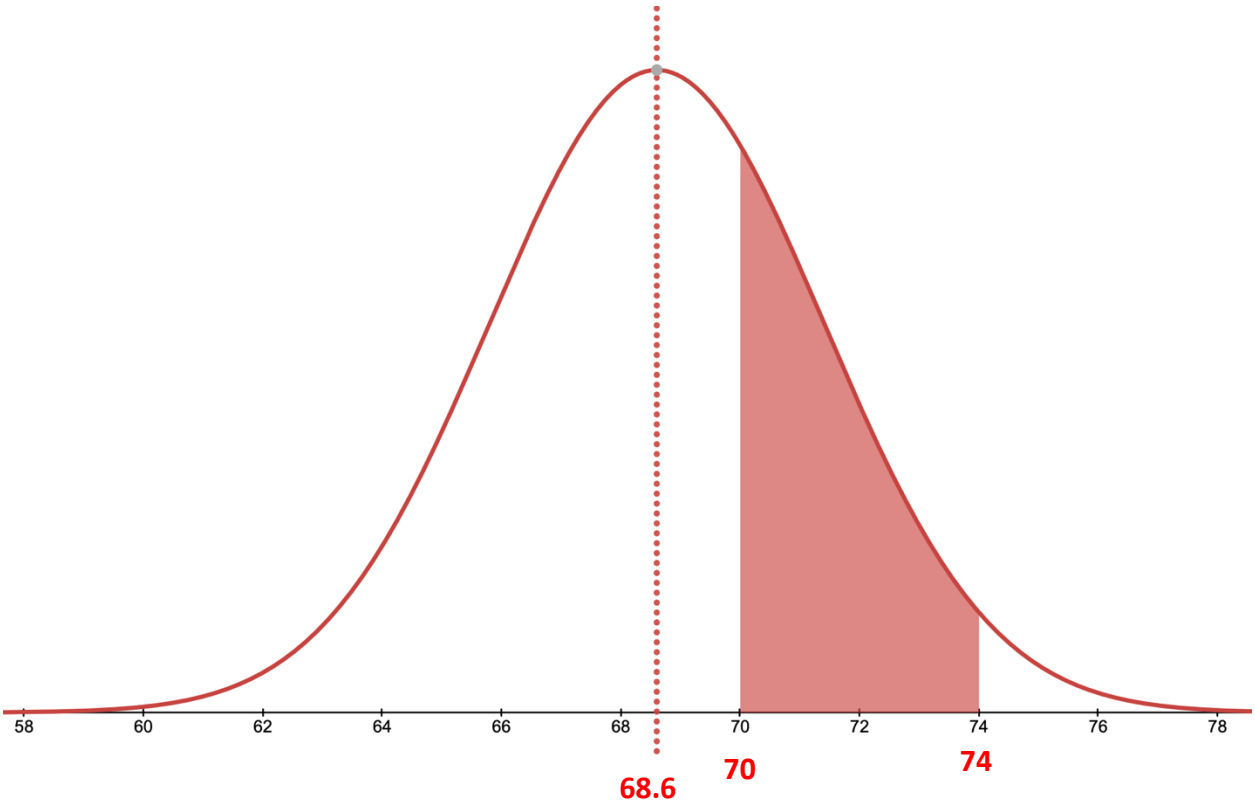


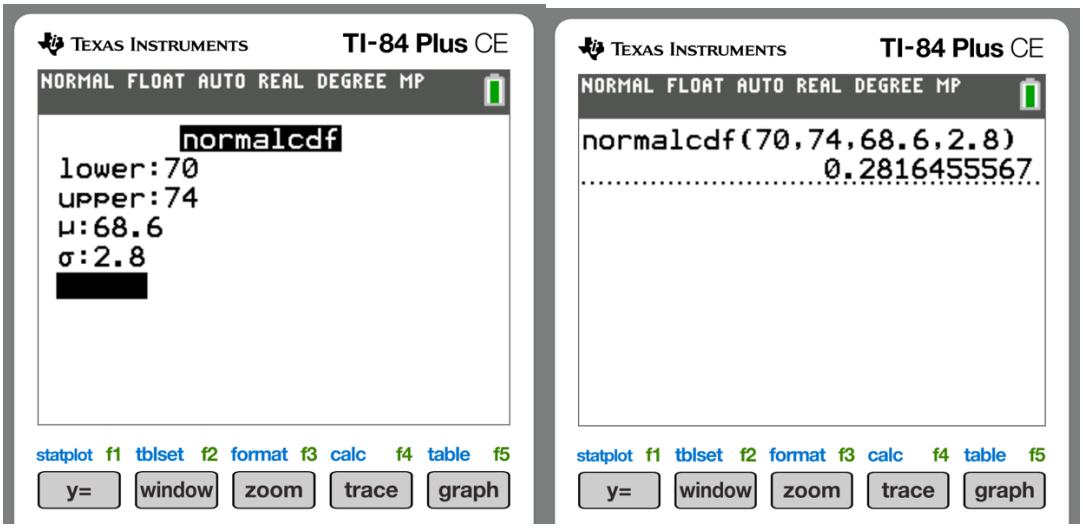


$$p(x < 63) \approx 0.023$$

Not Likely

24. Between 70 and 74 inches?



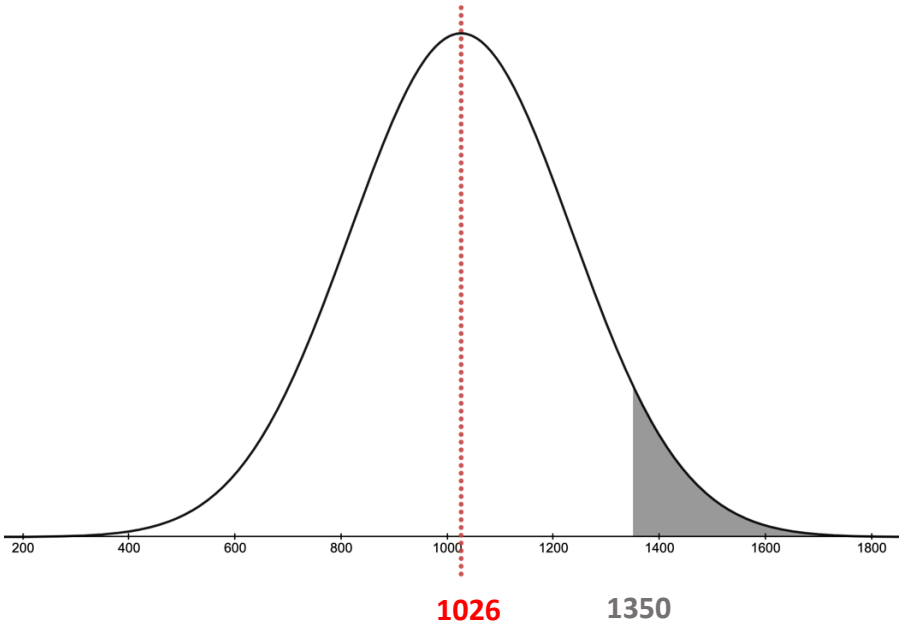


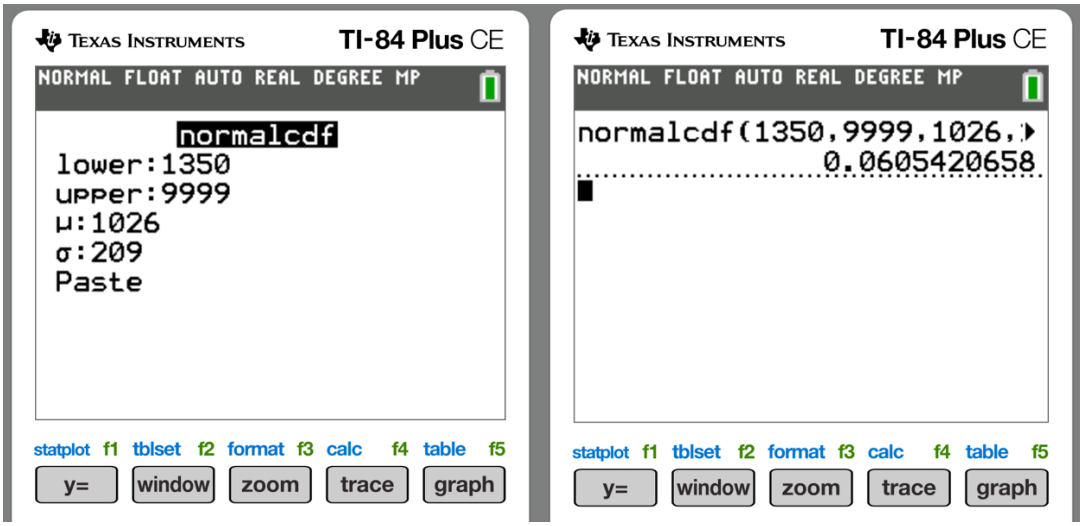
$$p(70 \leq x \leq 74) \approx 0.282$$

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.

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

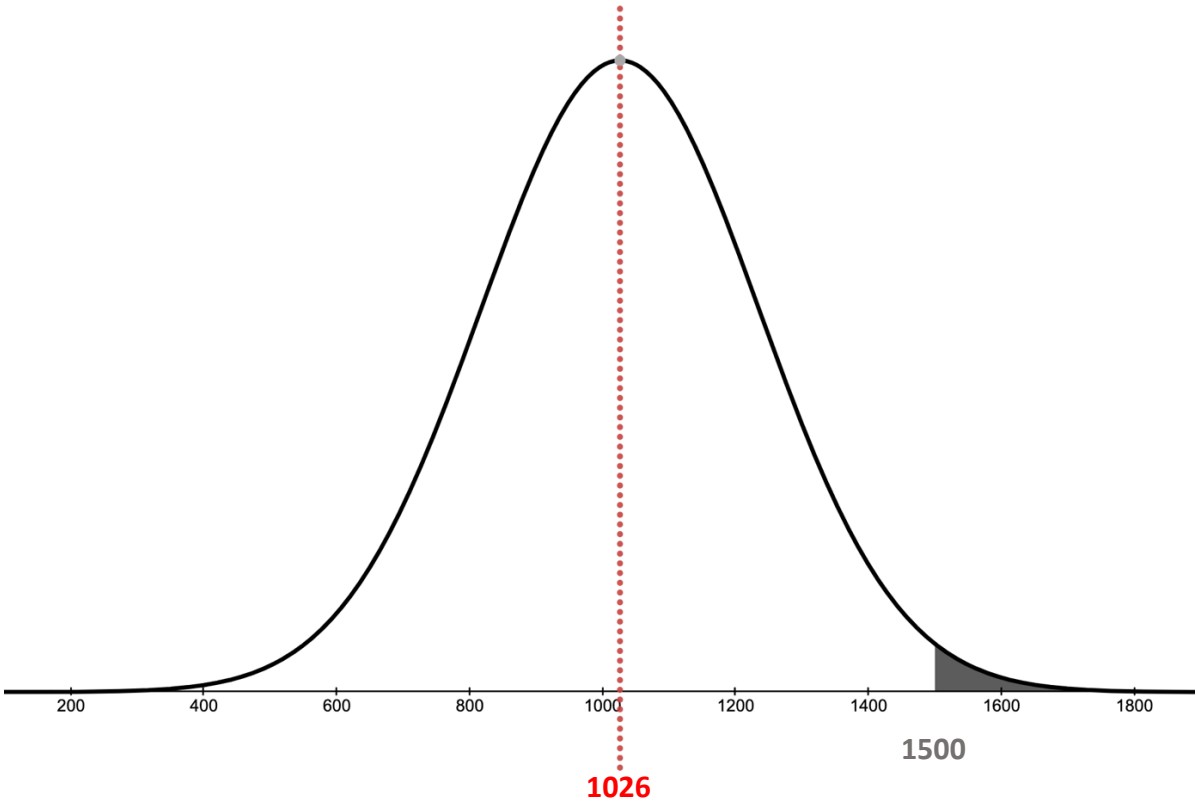
25. At least 1350? $x \geq 1350$

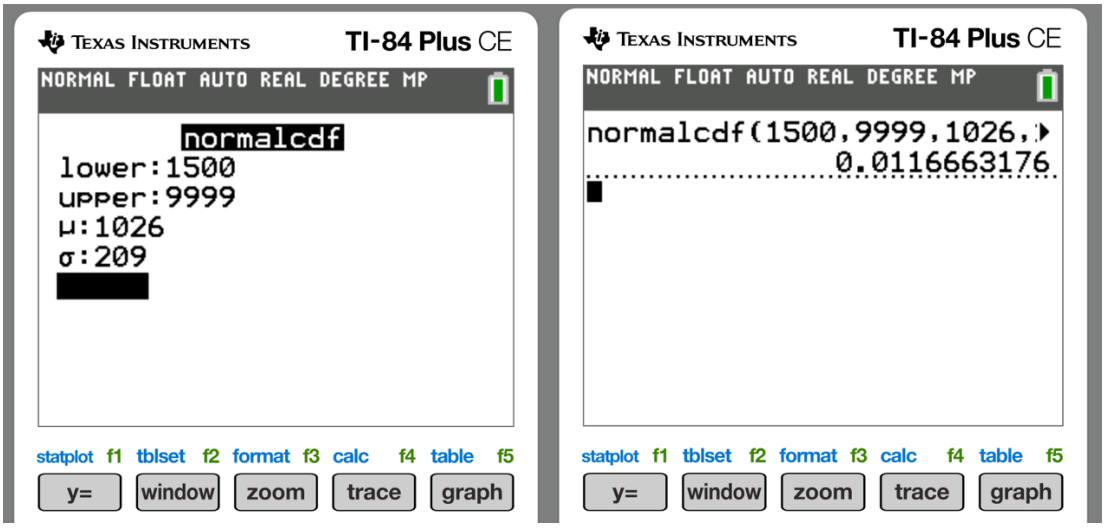




$$p(x \geq 1350) \approx 0.061$$

26. More than 1500? $x > 1500$

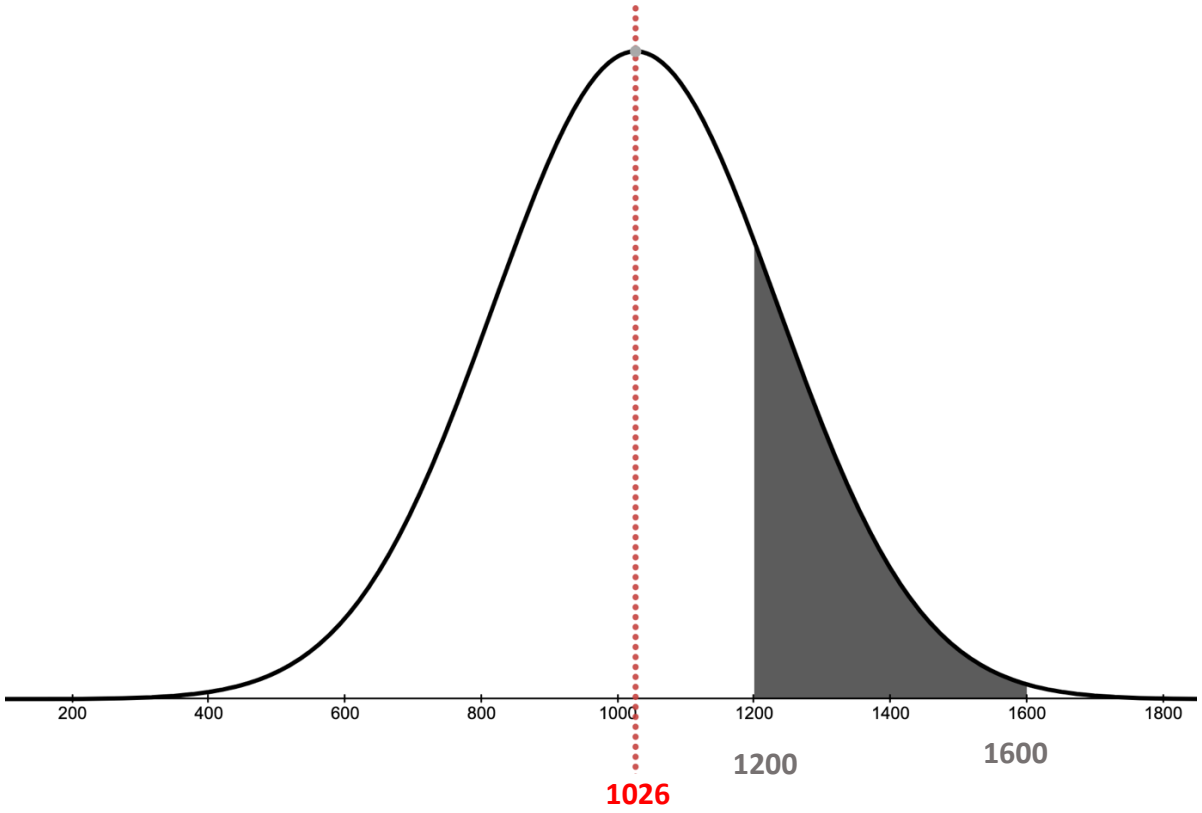


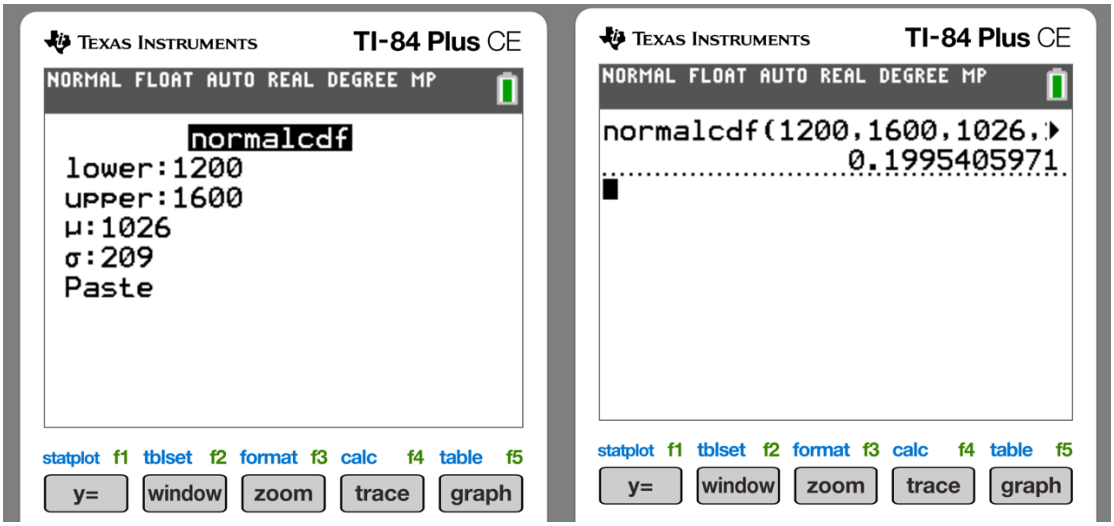


$p(x > 1500) \approx 0.012$

Not Likely

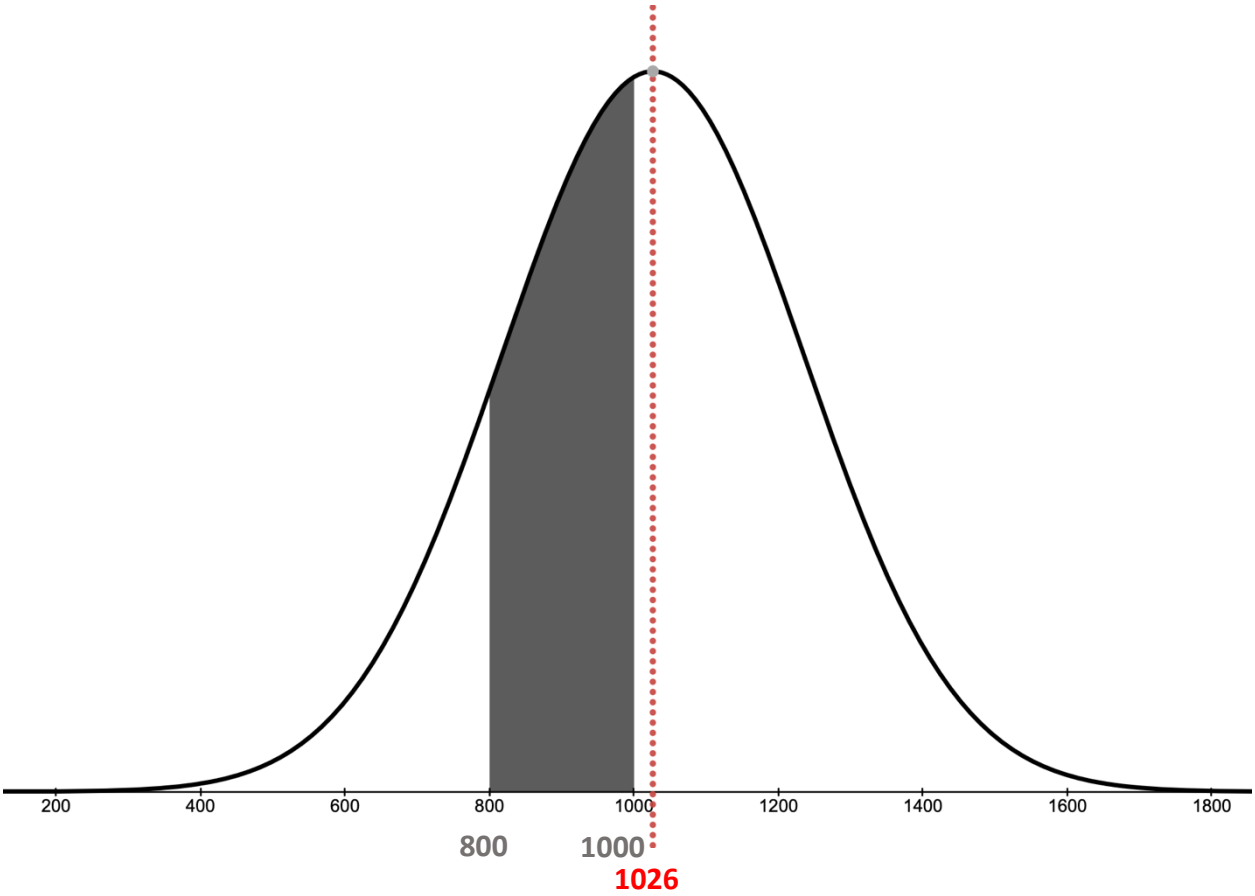
27. Between 1200 and 1600? $1200 \leq x \leq 1600$

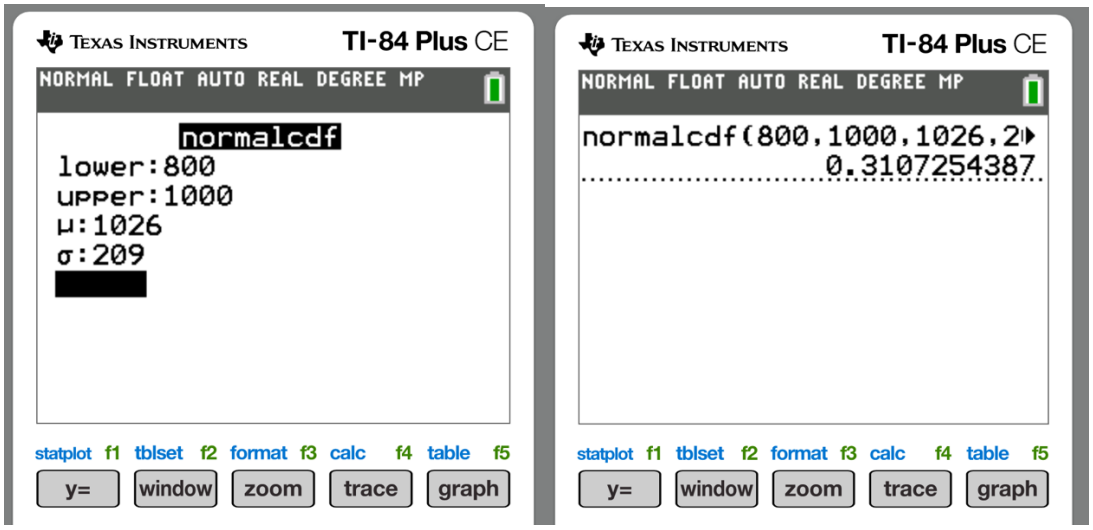




$p(x > 1500) \approx 0.200$

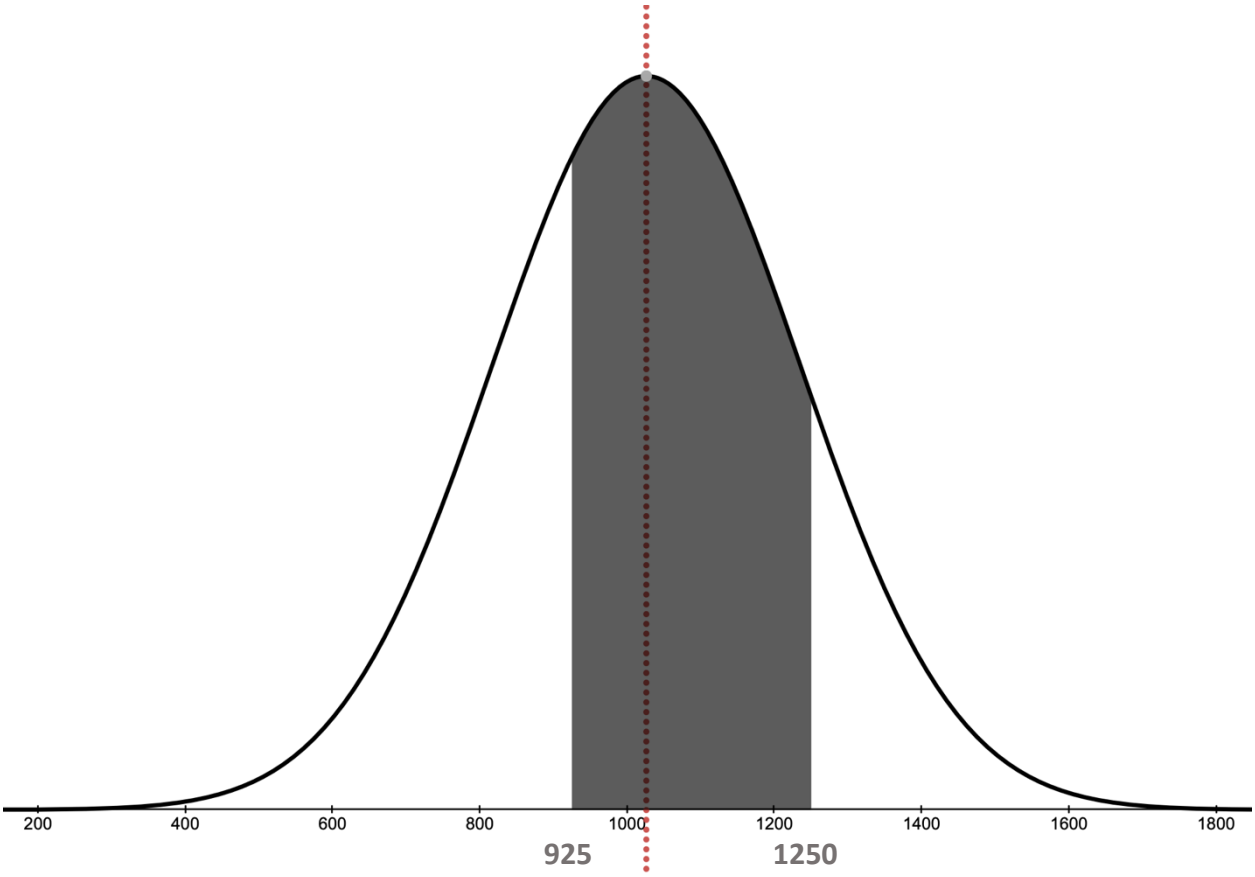
28. Between 800 and 1000?

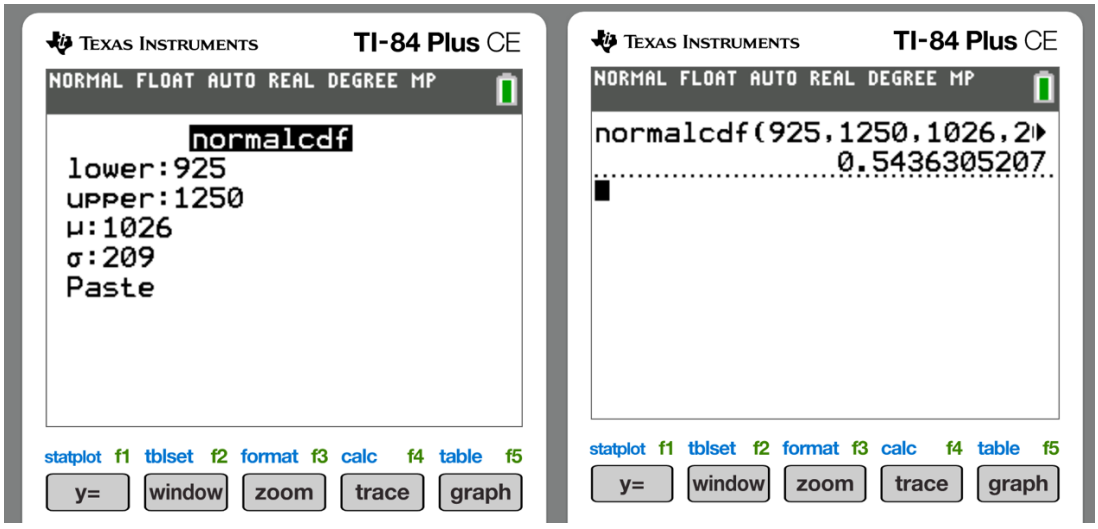




$$p(800 \leq x \leq 1000) \approx 0.311$$

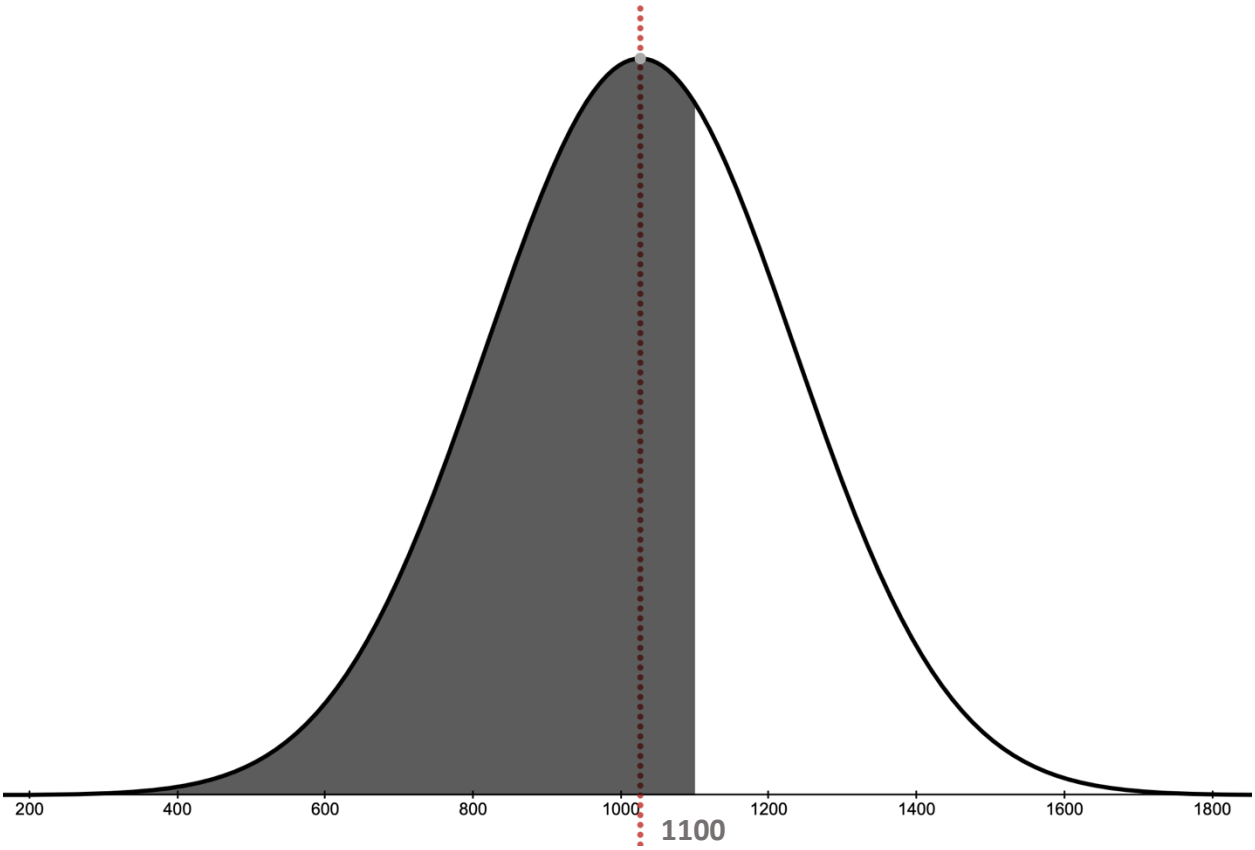
29. Between 925 and 1250?

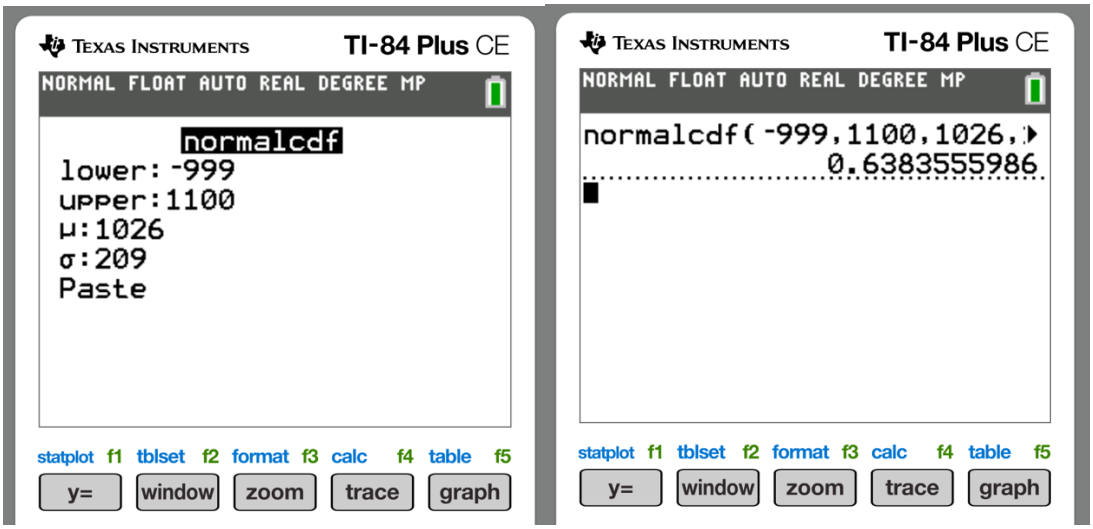




$$p(925 \leq x \leq 1250) \approx 0.544$$

30. Less than 1100?





$$p(x < 1100) \approx 0.638$$