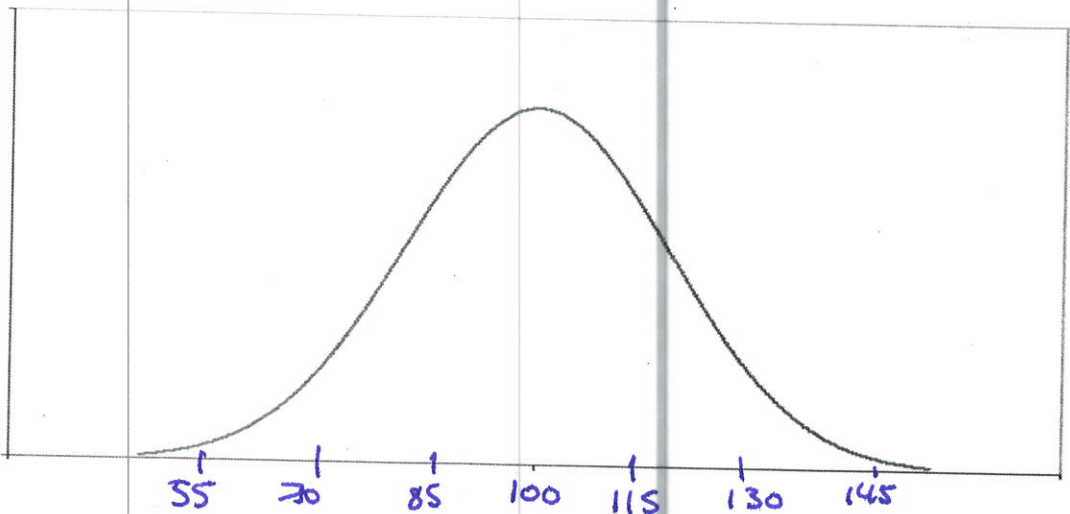**Instructions**: Show all work. Use exact answers, unless specifically asked to round.

1. IQs are normally distributed with a mean 100 and a standard deviation of 15. What percentage of the population has an IQ score which falls between 85 and 115?

$$68\%$$

Draw the distribution on the graph below.

55   70   85   100   115   130   145

2. The SAT math test has a mean score of 500 and a standard deviation of 100. The ACT has a mean score of 21, with a standard deviation of 5. Suppose that Veronica received a 680 on the SAT and a Kamala received a score of 28 on the ACT. Which of them received the higher score?

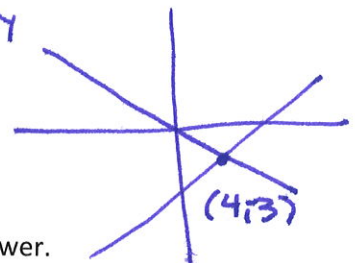$$\frac{680-500}{100} = 1.8 \qquad \frac{28-21}{5} = 1.4 \qquad \text{Veronica Scored higher}$$

3. Use a graph to solve the system $\begin{cases} 2x - 2y = 14 \\ 3x + 4y = 0 \end{cases}$. Sketch the graph and label the intersection.

$$x - y = 7 \implies x - 7 = y$$
$$y = -\frac{3}{4}x$$

$$(4, -3)$$

(4,-3)

4. Solve the same system above by substitution and confirm your answer.

$$3x + 4(x-7) = 0 \qquad 4 - 7 = -3$$
$$7x - 28 = 0 \qquad (4, -3)$$
$$7x = 28$$
$$x = 4$$

5. A bacteria colony starts out with 6 bacteria and it doubles in size every hour according to the equation $P(t) = 6 \cdot 2^t$. How many bacteria will there be at the same time tomorrow (i.e. after one day passes)?

$t = 24$ hours

$P(24) = 6 \cdot 2^{24} = 100,663,296$