



The amount of caffeine, X in mg, found in a cup of tea can be modelled by the normal distribution $X \sim N(26, 5)$

a) Find the probability that a randomly selected cup of tea contains at least 27 mg of caffeine.

b) 10 cups of tea are randomly selected. Find the probability that more than 5 of these cups has at least 24 mg of caffeine.



<p>a)</p> <p>Lower = 27</p> <p>Upper = 9×10^{99}</p> <p>Standard deviation = $\sqrt{5}$</p> <p>Mean = 26</p> <p>$P(X > 27) \approx 0.327$</p> <p>{a higher degree of accuracy of this value will be used in the next part of the question}</p>	<p>A normal distribution curve is shown with a dashed vertical line at the mean, 26. A solid vertical line is drawn at 27, and the area under the curve to the right of 27 is shaded with red diagonal lines.</p>
<p>b) This question becomes one about the Binomial Distribution.</p> <p>$n = 10$</p> <p>$p = 0.32736$</p> <p>Let Y be number of cups of tea that have at least 27 mg of caffeine.</p> <p>$Y \sim B(10, 0.32736)$</p> <p>$P(Y \geq 6) \approx 0.0706$</p>	