Warm-Up 18

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1 Formula Area

1. The normal distribution pdf is $\frac{1}{\sqrt{2\pi\sigma^2}} \exp(-0.5(x-\mu)^2/\sigma^2)$
2. Recall the 68 - 95 - 99.7 rule.
3. Recall that the *area under the pdf* is the probability. The total area is 1, and the area between points a and b is less than one, or a fraction of the total probability.

2 Reviewing the normal distribution

1. What is the probability a measurement is within 3 standard deviations from the mean of its underlying normal distribution (pdf)? That is, *above or below* the mean by three or fewer standard deviations?
   - A: 68 percent
   - B: 95 percent
   - C: 99.7 percent
   - D: 34 percent
2. What is the probability a measurement is 1 standard deviation **away from** the mean of its underlying normal distribution (pdf)? That is, *above* or *below* the mean by one standard deviation?
   - A: 32 percent
   - B: 5 percent
   - C: 0.3 percent
   - D: 15 percent
3. What is the probability a measurement is 1 standard deviation **larger than** the mean of its underlying normal distribution (pdf)? That is, *above* the mean by one standard deviation?
   - A: 68 percent
   - B: 95 percent
   - C: 32 percent
   - D: 16 percent
4. What is the probability a measurement is 2 standard deviations **larger than** the mean of its underlying normal distribution (pdf)? That is, *above* the mean by two standard deviations?
   - A: 1 percent
   - B: 2 percent
   - C: 2.5 percent
   - D: 10 percent