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Mr. Schlansky

2nd VARS (Dist)
2^o normal cdf

Date _____
Algebra II

Normal Distribution Without the Curve

1. The heights of women in the United States are normally distributed with a mean of 64 inches and a standard deviation of 2.75 inches. The percent of women whose heights are between 64 and 69.5 inches, to the *nearest whole percent*, is

- 1) 6
- ~~2) 48~~
- 3) 68
- 4) 95

normal cdf
 $\frac{\text{lower} = 64}{\text{upper} = 69.5}$.977..
 $\mu = 64$
 $\sigma = 2.75$

2. The lifespan of a 60-watt lightbulb produced by a company is normally distributed with a mean of 1450 hours and a standard deviation of 8.5 hours. If a 60-watt lightbulb produced by this company is selected at random, what is the probability that its lifespan will be between 1440 and 1465 hours?

- 1) 0.3803
- 2) 0.4612
- ~~3) 0.8415~~
- 4) 0.9612

normal cdf
 $\frac{\text{lower} = 1440}{\text{upper} = 1465}$.8415..
 $\mu = 1450$
 $\sigma = 8.5$

3. There are 440 students at Thomas Paine High School enrolled in U.S. History. On the April report card, the students' grades are approximately normally distributed with a mean of 79 and a standard deviation of 7. Students who earn a grade less than or equal to 64.9 must attend summer school. The number of students who must attend summer school for U.S. History is closest to

- (1) 3
- (2) 5
- ~~(3) 10~~
- (4) 22

normal cdf
 $\frac{\text{lower} = 0}{\text{upper} = 64.9}$
 $\mu = 79$
 $\sigma = 7$
 $.021 \cdot (440) = 10$

4. The number of hours students spent studying for their Regents exam is normally distributed with a mean of 14 hours and a standard deviation of 3.2 hours. If a student is randomly selected, what is the probability that they spent less than 5 hours studying? What is the probability that a student spent more than 22 hours studying? Round your answer to the nearest tenth of a percent.

normal cdf
 $\frac{\text{lower} = 22}{\text{upper} = 1000,000}$.006..
 $\mu = 14$
 $\sigma = 3.2$
 0.6%

normal cdf
 $\frac{\text{lower} = 0}{\text{upper} = 5}$.002..
 $\mu = 14$
 $\sigma = 3.2$
 0.2%

normal cdf

5. The scores on a math test are normally distributed with a mean of 76.2 and a standard deviation of 4.7. If 248 students took the exam, approximately how many students got between a 70 and an 80?

normal cdf

lower = 70
upper = 80
 $\mu = 76.2$
 $\sigma = 4.7$

.697... (248)

173

normal cdf

6. The number of hours of sleep employees at a company get per night is normally distributed with a mean of 7.1 hours and a standard deviation of 1.4 hours. If an employee is randomly selected, what is the probability they sleep between 5 and 8 hours each night? Round your answer to the nearest percent. If there are 2500 employees at the company, approximately how many of them, to the nearest person, got less than 5 hours of sleep?

normal cdf

lower = 5
upper = 8
 $\mu = 7.1$
 $\sigma = 1.4$

.673... (100)

67%

normal cdf

lower = 0
upper = 5
 $\mu = 7.1$
 $\sigma = 1.4$

.0668... (2500)

167

7. The heights of students in an elementary school are normally distributed with a mean of 35.7 inches and a standard deviation of 3.2 inches. If a student is chosen at random from the elementary school, what is the probability that they will be between 34 and 35 inches? If there are 235 students in the elementary school, to the nearest child, how many students are more than 40 inches tall?

normal cdf

lower = 34
upper = 35
 $\mu = 35.7$
 $\sigma = 3.2$

.115794682...

normal cdf

lower = 40
upper = aaaaaaaaa
 $\mu = 35.7$
 $\sigma = 3.2$

.0895... (235)

21

8. The GPAs of students in an Honors math class are normally distributed with a mean of 94.7 and a standard deviation of 1.6. What is the probability that a student selected at random in this math class will have a GPA between 90 and 95? Round your answer to the nearest percent. If there are 28 students in the class, to the nearest student, how many have a GPA higher than 96?

Normal cdf
 lower: 90
 upper: 95
 $\mu = 94.7$
 $\sigma = 1.6$
 .5727 (100)
 57

Normal cdf
 lower: 96
 upper: 99.9999999
 $\mu = 94.7$
 $\sigma = 1.6$
 .20525 (28)
 6

9. The weights of students on the boys cross country team is normally distributed with a mean of 135.3 pounds and a standard deviation of 2.8 pounds. Jackson believes that the probability of a student being between 132 and 134 is greater than the probability of a student being between 135 and 136.5 pounds. Is Jackson correct? Justify your answer.

Normal cdf
 lower: 132
 upper: 134
 $\mu = 135.3$
 $\sigma = 2.8$
 .2019370463

Normal cdf
 lower: 135
 upper: 136.5
 $\mu = 135.3$
 $\sigma = 2.8$
 .2085446281

No, 2019 < 2085.

10. The weight of a bag of pears at the local market averages ^{mean} 8 pounds with a standard deviation of 0.5 pound. The weights of all the bags of pears at the market closely follow a normal distribution. Determine what percentage of bags, to the nearest integer, weighed less than 8.25 pounds. If there are 225 bags at the local market, to the nearest integer, how many bags weigh more than 9 pounds?

Normal cdf
 lower: 0
 upper: 8.25
 $\mu = 8$
 $\sigma = 0.5$
 .69146 (100)
 69

Normal cdf
 lower: 9
 upper: 99.9999999
 $\mu = 8$
 $\sigma = 0.5$
 .07715 (225)
 5

