Act. #77

For each question, construct a normal distribution curve and label the horizontal axis. Then answer each question.

1. The mean life of a tire is 30,000 km. The standard deviation is 2000 km.
   a) 68% of all tires will have a life between _____ km and _____ km.
   b) 95% of all tires will have a life between _____ Km and _____ Km.
   c) What percent of the tires will have a life that exceeds 26,000 km?
   d) If a company purchased 2000 tires, how many tires would you expect to last more than 28 000 km?

2. The shelf life of a particular dairy product is normally distributed with a mean of 12 days and a standard deviation of 3 days.
   a) About what percent of the products last between 9 and 15 days?
   b) About what percent of the products last between 12 and 15 days?
   c) About what percent of the products last 6 days or less?
   d) About what percent of the products last 15 or more days?

3. A line up for tickets to a local concert had an average (mean) waiting time of 20 minutes with a standard deviation of 4 minutes.
   a) What percentage of the people in line waited for more than 28 minutes?
   b) If 2000 ticket buyers were in line, how many of them would expect to wait for less than 16 minutes?

4. On a recent math test, the mean score was 75 and the standard deviation was 5. Mike made 93. Would his mark be considered an outlier if the marks were normally distributed? Explain.

5. In an Oreo factory, the mean mass of a cookie is given as 40 g. For quality control, the standard deviation is 2 g.
   a) If 10,000 cookies were produced, how many cookies are within 2 g of the mean?
   b) Cookies are rejected if they weigh more than 44 g or less than 36 g. How many cookies would you expect to be rejected in a sample of 10,000 cookies?

6. The speeds of cars on the highway have a mean of 95 km/h with a standard deviation of 5 km/h.
   a) What percentage of cars averaged less than 85 km/h?
   b) If a police car stopped cars that were going more than 105 km/h, how many cars would they stop if there were 8000 cars on the highway?

7. Find the <u>middle term</u> for $(2xy + 3)^8$.

8. Find the <u>middle term</u> for $(x^3y - 3)^{10}$

9. Find the <u>middle term</u> for $(3m^4 - y^2)^8$.

(10) The Floppy Disk Company makes 3.5 inch floppy disks for disk drives that are 3.7 inches wide. The size of a manufactures disk is normally distributed with a standard deviation of 0.1 inches. The company manufactures 1000 disks every hour.
   a) What % of the disks would you expect to be greater than 3.5 inches?
   b) In one hour, how many disks would you expect to be between 3.4 inches and 3.7 inches?
   c) About how many disks will be unable to fit in the disk drive (3.7 inch won't fit)?

(11). The mean life of a battery is 50 hours with a standard deviation of 6 hours. The manufacturer advertises that they will replace all batteries that last less than 38 hours. If 50,000 batteries were produced, how many would they expect to replace?

(12). A bottle of fruit punch contains at least 473 ml. The machine that fills the bottles is set so that the mean volume is 477 ml. The volumes in the bottles are normally distributed.
   a) What percent of the bottles are underfilled if the standard deviation is 2 ml?
   b) What percent of the bottles are underfilled if the standard deviation is 4 ml?

(13) A grading scale is set up for 1000 students' test scores. It is assumed that the scores are normally distributed with a mean score of 75 and a standard deviation of 15
   a) How many students will have scores between 45 and 75?
   b) If 60 is the lowest passing score, how many students are expected to pass the test?

(14) The monthly income of 5,000 workers at the Microsoft plant are distributed normally. Suppose the mean monthly income is $1,250 and the standard deviation is $250.
   a) How many workers earn more than $1500 per month?
   b) How many workers earn less than $750 per month?
   c) What percentage of the workers earn between $750 and $1500 per month?
   d) What percentage of the workers earn less than $1750 per month?

(15) Find the difference in the rates for $4000 deposited for 3 years. ONE account drew $506 interest. The other account drew $780 interest. (Round to the nearest tenths).

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Here are the scores for a recent test in M414 Statistics.

90	90	95	100	80	80	75	80	70	60	95	100	100
100	75	80	90	90	90	70	70	80	85	90	90	85

Answer the following questions regarding this set of data.

16 Median = _____

17 Mean = _____

18 Mode = _____

19 Standard Deviation = _____
(nearest whole #)

20 How many scores are within 1 standard deviation of the mean? _____

21 How many scores are within 2 standard deviations of the mean? _____

22 What **percentage** of the scores are between 63 and 85?

23 What **percentage** of the scores are less than 74 ?

24 How many students scored between 74 and 96?

25 What **percentage** of the scores are between 63 and 107 ?

26 How many students scored between 74 and 85?

27 What **percentage** of scores is less than 85?

28 What is the VARIANCE of the data above?

29 What percentage of the scores fall 2 standard deviations below the mean?

30 How many students scored within 3 standard deviations of the mean?

31 If you would randomly choose 2 scores, what would be the probability of choosing a score below one standard deviation and then above 2 standard deviations?

Draw the curve and label it on another sheet of paper.