

## ALGEBRA II

### Chapter 11 section 3, Use Normal Distributions

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#### VOCAB:

**Normal Distribution:** a probability distribution with mean and standard deviation modeled by a bell-shaped curve (below)

**Normal Curve:** a smooth, symmetrical, bell-shaped curve that can model normal distributions and approximate some binomial distributions

**Standard Normal Distribution:** the normal distribution with mean 0 and standard deviation 1

**z - score:** converts x-values to a standard normal table with deviation of 1, telling us the number of deviations the x-value lies above or below the mean. It makes your data proportional to the standard normal table.

$$z = \frac{x - \bar{x}}{\sigma}$$

#### WARM – UP:

Simplify the expression.

1.  $\frac{93 - 97}{1.5}$  \_\_\_\_\_

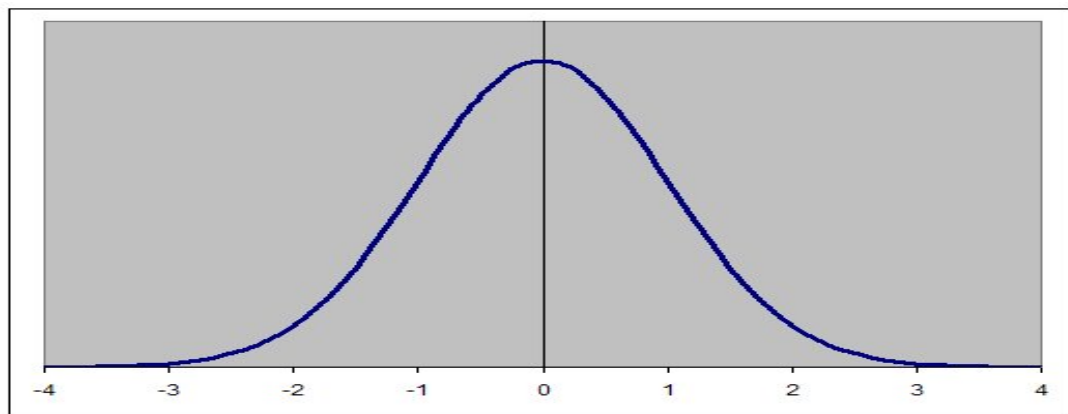
2.  $\frac{20 - 18}{0.8}$  \_\_\_\_\_

3.  $2(0.34) + 2(0.135)$  \_\_\_\_\_

4. Sixty - eight percent of a sample of cars tested got between 27 and 32 miles per gallon of gasoline. What percent of the cars tested got less than 27 miles per gallon or more than 32 miles per gallon?

#### NOTES:

##### AREAS UNDER A NORMAL CURVE



A normal distribution has mean  $\bar{x}$  and standard deviation  $\sigma$ . For a randomly selected x - value from the distribution, find

$$P(\bar{x} - \sigma \leq x \leq \bar{x} + 3\sigma)$$

$$P(x \leq \bar{x} + 2\sigma)$$

The score of an exam for entrance to a firefighter program are normally distributed with a mean of 200 points and standard deviation of 20 points.

About what percent of the candidates score lower than 160 points? \_\_\_\_\_

Candidates with scores above 220 are admitted into the training program. About what percent of the candidates are accepted into the program?

\_\_\_\_\_

A survey of 20 colleges found that the average credit card debt for seniors was \$3,450. The debt was normally distributed with a standard deviation of \$1,175. Find the probability that the credit card debt of the seniors was at most \$3600.

Standard Normal Table										
<b>z</b>	<b>.0</b>	<b>.1</b>	<b>.2</b>	<b>.3</b>	<b>.4</b>	<b>.5</b>	<b>.6</b>	<b>.7</b>	<b>.8</b>	<b>.9</b>
<b>-3</b>	.0013	.0010	.0007	.0005	.0003	.0002	.0002	.0001	.0001	.0000+
<b>-2</b>	.0228	.0179	.0139	.0107	.0082	.0062	.0047	.0035	.0026	.0019
<b>-1</b>	.1587	.1357	.1151	.0968	.0808	.0668	.0548	.0446	.0359	.0287
<b>-0</b>	.5000	.4602	.4207	.3821	.3446	.3085	.2743	.2420	.2119	.1841
<b>0</b>	.5000	.5398	.5793	.6179	.6554	.6915	.7257	.7580	.7881	.8159
<b>1</b>	.8413	.8643	.8849	.9032	.9192	.9332	.9452	.9554	.9641	.9713
<b>2</b>	.9772	.9821	.9861	.9893	.9918	.9938	.9953	.9965	.9974	.9981
<b>3</b>	.9987	.9990	.9993	.9995	.9997	.9998	.9998	.9999	.9999	1.0000

QUESTIONS?