

Chapter 6 Practice Test
Algebra 2 with Trigonometry

Find the number of permutations or combinations.

1. 9C_7

36

2. ${}^{13}C_{12}$

13

Use the binomial theorem to expand:

3. $(x + 3)^3$

$1(x)^3(\cancel{3})^0$

$3(x)^2(3)^1$

$3(x)^1(3)^2$

$1(\cancel{x})^0(3)^3$

$x^3 + 9x^2 + 27x + 27$

4. $(2s - 1)^4$

$1(2s)^4(\cancel{-1})^0$

$4(2s)^3(-1)^1$

$6(2s)^2(-1)^2$

$4(2s)^1(-1)^3$

$1(\cancel{2s})^0(-1)^4$

$16s^4 - 32s^3 + 24s^2 - 8s + 1$

Find the number of possible 5-card hands that contain the cards specified. The cards are taken from a standard 52-card deck.

5. 1 diamond and 4 non-diamonds

$$13C_1 \times 39C_4$$

$$13 \times 82,251$$

1,069,263

6. At least 1 face card

$$(12C_1 \times 40C_4) + (12C_2 \times 40C_3) + (12C_3 \times 40C_2) + (12C_4 \times 40C_1) + (12C_5 \times 40C_0)$$

1,940,952

7. A sandwich shop runs a lunch special where you can buy a large sandwich with one bun, two cheeses, two meats, and three vegetables, for \$6. You have a choice of 3 different buns, 6 cheeses, 7 meats, and 8 vegetables. How many different variations of the sandwich special are possible?

$$3C_1 \times 6C_2 \times 7C_2 \times 8C_3$$

52,920

8. You are going to toss 6 different coins. How many different ways will at most 3 of the coins show tails?

$$6C_3 + 6C_2 + 6C_1 + 6C_0$$

42

Find the mean, median, mode(s), and range of the data.

~~21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100~~

23 25 27 31 43/44 44 50 50 62

9. Mean

39.9

10. Median

43.5

11. Mode

44, 50

12. Range

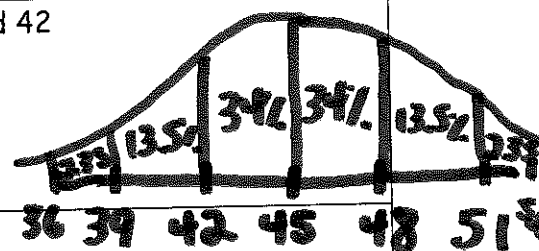
39

Using the normal curve find the probability for a randomly selected x -value from the distribution.

13. $P(x \leq \bar{x} - \sigma)$ <u>16%</u>	14. $P(x \geq \bar{x} + 2\sigma)$ <u>2.5%</u>
15. $P(\bar{x} - 3\sigma \leq x \leq \bar{x} + \sigma)$ <u>83.85%</u>	16. $P(\bar{x} \leq x \leq \bar{x} - 2\sigma)$ <u>47.5%</u>

A normal distribution has a mean of 45 and a standard deviation of 3. Find the probability that a randomly selected x -value from the distribution is in the given interval.

17. Between 42 and 51 <u>81.5%</u>	18. Between 39 and 42 <u>13.5%</u>
19. At least 54 <u>.15%</u>	20. At most 48 <u>84%</u>



21. A study found the life of a car battery is normally distributed with a mean life of 50 months and standard deviations of 4 months. What is the probability that a randomly selected battery will have a life of at most 47 months?

$$z = \frac{47 - 50}{4} = -.75 \quad P(z \leq -.8)$$

21.19%

22. The time a medical team takes to arrive at the scene of an accident is normally distributed with a mean of 6 minutes and a standard deviation of 2 minutes. What is the probability that a medical team takes at most 7 minutes to arrive at the scene of an accident?

$$z = \frac{7 - 6}{2} = .5 \quad P(z \leq .5)$$

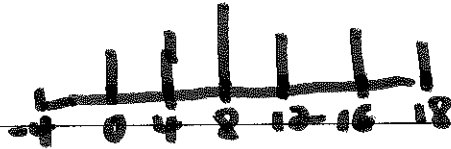
69.15%

23. After sending, the email of a certain system has normally distributed arrival times with a mean time of 8 seconds and standard deviation of 4 seconds. What is the probability that a randomly selected email will take longer than 17 seconds to arrive?

$$z = \frac{17-8}{4} \approx 2.3$$

$$P(z \leq 2.3) = 98.93\%$$

1.07%



$$100\% - 98.93\%$$

Identify the type of sample described. Then tell if the sample is biased. Explain your reasoning.

24. A newspaper is conducting a story to find out people's favorite sport. The newspaper asks every other person attending a baseball game.

**biased
systematic**

25. A library wants to know how their patrons will respond to increased evening hours. For the next three months, every 3rd person is surveyed.

**unbiased
systematic**

26. A newspaper is sponsoring a poll, and wants to find out the preferences of farmers across the state regarding the state governor's election. The newspaper surveys farmer in the local area to gather their data.

**biased
convenience**

27. A school wants to know how many of its parents are happy with the after-school program. It sends home a letter asking parents to call in with their opinion.

**biased
self-selected**

28. In a survey of 139 local high school students, 83% of the students said they know how to swim. Find the margin of error for the survey, and give an interval that is likely to contain the exact percent of all local high school students that know how to swim.

$$\pm \frac{1}{\sqrt{139}} \approx \pm 8.5\%$$

$$\pm 8.5\%$$

$$74.5\% - 91.5\%$$

29. In a survey of 212 people at the local track and field championship, 72% favored the home team winning. Find the margin of error for the survey, and give an interval that is likely to contain the exact percent of all people who favor the home team winning.

$$\pm \frac{1}{\sqrt{212}} \approx \pm 6.9\%$$

$$\pm 6.9\%$$

$$65.1\% - 78.9\%$$

Find the sample size required to achieve the given margin of error. Round your answer to the nearest whole number.

30. 2%

$$\frac{1}{\sqrt{x}} = .02 \quad \frac{.02\sqrt{x}}{.02} = \frac{1}{.02}$$

$$(\sqrt{x})^2 = \left(\frac{1}{.02}\right)^2$$

$$2500$$

31. 4.5%

$$\frac{1}{\sqrt{x}} = .045$$

$$(\sqrt{x})^2 = \left(\frac{1}{.045}\right)^2$$

$$494$$