

Chapter 6 Practice Test
Algebra 2 with Trigonometry

Name

Key

Period

Find the number of permutations or combinations.

1. ${}_{12}C_4$

495

2. ${}_{16}P_3$

560

Use the binomial theorem to expand:

3. $(2x+3)^6$

$$\begin{aligned} & 1 (2x)^6 (3)^0 \\ & 6 (2x)^5 (3)^1 \\ & 15 (2x)^4 (3)^2 \\ & 20 (2x)^3 (3)^3 \\ & 15 (2x)^2 (3)^4 \\ & 6 (2x)^1 (3)^5 \\ & 1 (2x)^0 (3)^6 \end{aligned}$$

$$64x^6 + 576x^5 + 2160x^4 + 4320x^3 + 4860x^2 + 2916x + 729$$

4. $(3x-1)^8$

$$\begin{aligned} & 1 (3x)^8 (-1)^0 \\ & 8 (3x)^7 (-1)^1 \\ & 28 (3x)^6 (-1)^2 \\ & 56 (3x)^5 (-1)^3 \\ & 70 (3x)^4 (-1)^4 \\ & 56 (3x)^3 (-1)^5 \\ & 28 (3x)^2 (-1)^6 \\ & 8 (3x)^1 (-1)^7 \\ & 1 (3x)^0 (-1)^8 \end{aligned}$$

$$6561x^8 - 17496x^7 + 20412x^6 - 13608x^5 + 5670x^4 - 1512x^3 + 252x^2 - 24x + 1$$

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 king and 4 non-kings

$$4C_1 \times 48C_4$$

778,320

6. At least 1 jack

$$(4C_1 \times 48C_4) + (4C_2 \times 48C_3) + (4C_3 \times 48C_2) + (4C_4 \times 48C_1)$$

886,656

7. The Student Council Executive Board consists of 6 seniors, 5 juniors, 4 sophomores, and 3 freshmen. How many different committees of exactly 4 seniors and 2 freshmen can be chosen?

$$6C_4 \times 3C_2$$

45

8. You are going to toss 10 different coins. How many different ways will at most 3 of the coins show heads?

$$10C_3 + 10C_2 + 10C_1 + 10C_0$$

176

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

31, 62, 23, 44, 43, 25, 50, 27, 50, 44

9. Mean

39.9

10. Median

43.5

11. Mode

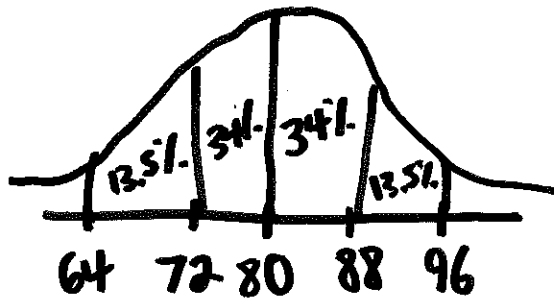
44, 50

12. Range

39

The scores on an Algebra 2 final exam are normally distributed with a mean of 80 points and standard deviation of 8 points.

13. About what percent of the students scored A+ (higher than 96 points)?



2.5%

14. Students with scores below 60 are required to take a makeup exam (NOT REALLY!). About what percent of the students need to take the makeup?

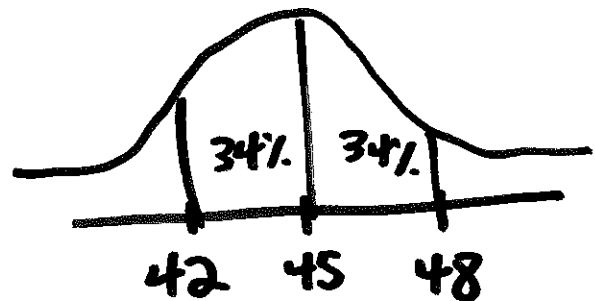
$$Z = \frac{60 - 80}{8} = -2.5$$

$$P(Z \leq -2.5)$$

.62%

15. A study found that the life of a car battery is normally distributed with mean life of 45 months and standard deviation of 3 months. What is the probability that a randomly selected battery will have a life of at most 42 years?

~~24.4%~~
~~3~~



16%

In a survey of 139 HHS students, 83% said that they know how to swim.

16. What is the margin of error for the survey? Round your answer to the nearest tenth of a percent.

$$\pm \frac{1}{\sqrt{139}}$$

8.5%

17. Give an interval that is likely to contain the exact percent of all students at HHS that know how to swim.

74.5% - 91.5%

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

Explain your reasoning.

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

Type of Sample Described: systematic

Is the Sample Biased? Explain Your Reasoning.

unbiased

19. A newspaper is sponsoring a poll, attempting to find out the specific preferences of farmers across the state for several different candidates running for governor of that state in an upcoming election. The newspaper surveys farmers from the town that their offices are located to gather their data.

Type of Sample Described: convenience

Is the Sample Biased? Explain Your Reasoning.

biased

Find the sample size required to achieve the given margin of error.

Round your answer to the nearest whole number.

20. $\pm 3\%$

$$\frac{1}{\sqrt{x}} = .03$$

$$\frac{.03\sqrt{x}}{.03} = \frac{1}{.03}$$

$$(\sqrt{x})^2 = \left(\frac{1}{.03}\right)^2$$

1111 people