

Algebra Placement Test Study Guide

1) Results of a survey of fifty students indicate that 30 like red jelly beans, 29 like green jelly beans, and 17 like both red and green jelly beans. **How many of the students surveyed like no green jelly beans?**

2) At the local convenience store, 3 bags of chips and 4 containers of dip cost \$18. However, 7 bags of chips and 3 containers of dip cost \$23. **What is the cost of one bag of chips and one container of dip?**

3) A box contains the following mixture of colored marbles: 2 black, 1 red, 2 yellow, and 3 green. **What is the probability** of drawing a red marble followed by a green marble if the two marbles are drawn without replacement?

4) **The sum of the angles of a triangle is 180°.** One angle of a triangle is 2 times as large as another. The measure of the third angle is 140° greater than that of the smallest angle. Find the measure of each angle.

5) A box of cereal contains about 12 cups. A serving size is $\frac{3}{4}$ cup. About how many servings are in the box of cereal?

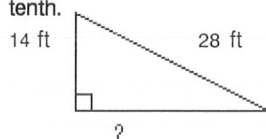
6) It is recommended that there be at least 13.65 square feet of ground space in a garden for every newly planted shrub. A garden is 27.3' by 21'. Find the maximum number of shrubs the garden can accommodate.

7) Austin bought 5 bottles of juice and 8 pies for a total cost of \$105.25. If x = the cost of a bottle of juice and y = the cost of one fruit pie, write an equation in two variables that reflects the given conditions.

8) Estimate: a) $\sqrt{52}$ b) $\sqrt{226}$

9) A restaurant has a capacity of 54 patrons. If the restaurant is $\frac{7}{18}$ full, how many patrons are at the restaurant?

10) Below is a diagram of a water slide. How far is it along the ground from the end of the slide back to the base of the ladder that leads to the slide? **Answer to the nearest tenth.**



11) Evaluate: $\frac{x^2}{y-z}$ for $x = \frac{7}{8}$, $y = \frac{7}{8}$, $z = \frac{1}{24}$

Write the answer in simplest form.

12) Solve: $\frac{3}{2}x + \frac{6}{5} = \frac{7}{5}x$

13) Solve: $0.31(x + 20) + 0.27(x + 15) = -10.05$

14) Solve:
$$\begin{cases} \frac{1}{2}x + \frac{1}{2}y = -1 \\ \frac{1}{2}x - \frac{1}{2}y = 6 \end{cases}$$

15) Simplify: $\left(\frac{3}{4} - \frac{1}{8}\right)^2 + \left(\frac{1}{2} + \frac{1}{8}\right)$

16) Simplify: $\left(\frac{4}{5} \cdot \frac{1}{6}\right) + \left(\frac{1}{2} \div \frac{3}{2}\right)$

17) Simplify: $[7 + (-3)]^3$

18) Scott set up a volleyball net in his backyard. One of the poles, which forms a right angle with the ground, is 6 feet high. To secure the pole, he attached a rope from the top of the pole to a stake 10 feet from the bottom of the pole. To the nearest tenth of a foot, find the length of the rope. **Round to the nearest tenth.**

19) One pound of a product yields $2\frac{3}{4}$ cups. How many pounds of this product will be required by a recipe that calls for 6 cups of the product?

20) The area of a rectangle is 10 square meters. If its width is $6\frac{2}{3}$ meters, find its length.

21) Claire has received scores of 85, 88, 87, and 90 on her algebra tests. What is the minimum score she must receive on the fifth test to have an overall test score average of at least 87?

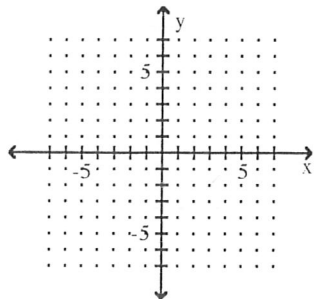
22) a. Find: $\sqrt[3]{-64}$ b. Estimate: $\sqrt[4]{525}$

- 23) a) Write the number in scientific notation.
A mountain's peak is 27,700 ft above sea level.

b) Simplify: $(-3)^{-2}$

- 24) Find the slope of the line containing the points:
 $(-1, -7)$ and $(6, -3)$

25) Graph: $y = -\frac{3}{5}x$



- 26) Solve: $5x - 7 \geq 4x - 8$ Graph the solution set.



- 27) Solve: $18x - 2 < 8x + 4$

- 28) Simplify: $|8 - 18| \cdot (-8) \div (-4)$

- 29) Simplify: $[2 \div (7 - 5) + 7^2] - [5 - (-1)]^2$

- 30) Evaluate: $(-5z)(-4x - 2y)$ for $x = -2$, $y = 3$, and $z = -4$

- 31) Find: $\frac{10 \times 10^{-8}}{5 \times 10^{-1}}$ Answer in scientific notation.

- 32) a. Write in decimal form: 2.254×10^6

- b. Write in scientific notation: 0.000461

- 33) Subtract $1 - 9x^5 + 4x^6 - 2x^4 + 6x$ from the sum of $7x^4 + 6x - 9$ and $6x^6 + 4x^5$.

- 34) Simplify: $3^{-1} + 8^{-1}$

- 35) Simplify: $(6x^2)^3 x^{-15}$

- 36) The circumference of a circle is 18π meters. Find the circle's diameter.

- 37) Which one of the following is a better buy: a 10-inch pizza for \$11 or two 6-inch pizzas for \$10.

- 38) A game has balls numbered 1 through 15. What is the probability of selecting an even numbered ball or a 6?

- 39) The table shows the number of college students who prefer a given pizza topping.

toppings	freshman	sophomore	junior	senior
cheese	13	11	18	20
meat	26	20	11	13
veggie	11	13	26	20

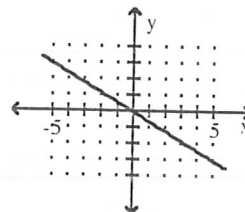
P(student prefers meat topping given that student is junior)

- 40) Eloise has put 5 cans (all of the same size) on her kitchen counter; 2 cans of vegetables, 2 cans of soup, and 1 can of peaches. Her son, Andy, takes the labels off the cans and throws them away. Eloise then chooses 2 cans at random to open. Find the probability that she will open at least 1 can of soup.

Answer Key

- 1) 21
 2) chips = \$2; dip = \$3
 3) $\frac{3}{56}$
 4) $10^\circ, 20^\circ, 150^\circ$
 5) 16 servings
 6) 42 shrubs
 7) $5x + 8y = 105.25$
 8) a) 7.211 b) 15.033
 9) 21 patrons
 10) $\sqrt{588}$ ft ≈ 24.2 ft
 11) $\frac{147}{160}$
 12) $\{-12\}$
 13) $\{-35\}$
 14) $\{(5, -7)\}$
 15) $\frac{65}{64}$
 16) $\frac{7}{15}$
 17) 64
 18) 11.7 ft.
 19) $2\frac{2}{11}$ lb
 20) $1\frac{1}{2}$ m
 21) 85
 22) a. -4 b. ~ 4.8
 23) a) 2.77×10^4 b) $\frac{1}{9}$

25)



26) $[-1, \infty)$



27) $\left(-\infty, \frac{3}{5}\right)$

28) 20

29) 14

30) 40

31) 2×10^{-7}

32) a. 2,254,000

b. 4.61×10^{-4}

33) $2x^6 + 13x^5 + 9x^4 - 10$

34) $\frac{11}{24}$

35) $\frac{216}{x^9}$

36) 18 m

37) 10-in. pizza

38) $\frac{7}{15}$

39) 0.200

40) $\frac{7}{10}$