

TSI Mathematics Assessment

The Texas Success Initiative (TSI) Mathematics and Statistics test contains questions that measure proficiency in four content areas. The four content areas are as follows:

Elementary Algebra and Functions — Topics covered in this category include:

- Linear equations, inequalities and systems
- Algebraic expressions and equations
- Word problems and applications

Intermediate Algebra and Functions — Topics covered in this category include:

- Quadratic and other polynomial expressions, equations and functions
- Expressions, equations and functions involving powers, roots and radicals
- Rational and exponential expressions, equations and functions

Geometry and Measurement — Topics covered in this category include:

- Plane geometry
- Transformations and symmetry
- Linear, area and three-dimensional measurements

Data Analysis, Statistics and Probability — Topics covered in this category include:

- Interpreting categorical and quantitative data
- Statistical measures
- Probabilistic reasoning

Mathematics Sample Questions:

For each of the questions below, choose the best answer from the four choices given. You may use the paper you received as scratch paper.

1. A ball was kicked into the air from a balcony 20 feet above the ground, and the ball's height above the ground, in feet, t seconds after the ball was kicked was $h(t) = 20 - 16t^2 + 32t$. What was the maximum height, in feet, of the ball above the ground after it was kicked?

- A. 32
- B. 34
- C. 36
- D. 40

2. There are 20 children in the cast of a class play, and 8 of the children are boys. Of the boys, 4 have a speaking part in the play, and of the girls, 8 do not have a speaking part in the play. If a child from the cast of the play is chosen at random, what is the probability that the child has a speaking part?

- A. $\frac{2}{5}$
- B. $\frac{1}{2}$
- C. $\frac{3}{5}$
- D. $\frac{3}{4}$

3. In the xy -plane, what is the y -intercept of the graph of the equation $y = 2(x + 3)(x - 4)$?

- A. -24
- B. -12
- C. -2
- D. 12

4. A group of 18 people ordered soup and sandwiches for lunch. Each person in the group had either one soup or one sandwich. The sandwiches cost \$7.75 each and the soups cost \$4.50 each. If the total cost of all 18 lunches was \$113.50, how many sandwiches were ordered?

- A. 7
- B. 8
- C. 9
- D. 10

5. If $\sqrt{5 - x} = 4$, then $x =$

- A. -21
- B. -11
- C. 1
- D. 11

6. In the xy -plane, a line runs through the coordinate (6, 9) and the origin. Which of the following is an equation of the line?

- A. $y = x - 3$
- B. $y = x + 3$
- C. $y = \frac{2}{3}x$
- D. $y = \frac{3}{2}x$

7. If $\frac{x-1}{x} = 20$, then $x =$

- A. -21
- B. -19
- C. $-\frac{1}{19}$
- D. $\frac{1}{21}$

8. The yard behind the Cindy's house is rectangular in shape and has a perimeter of 72 feet. If the length l of the yard is 18 feet longer than the width w of the yard, what is the area of the yard, in square feet?

- A. 36
- B. 144
- C. 243
- D. 486

Mathematics Sample Answers

1. C.

Choice C is correct. You have to find the maximum value of the parabola, referred to as the vertex. This is highest point on the graph. The easiest way to do this is to rearrange the equation into standard form: $h(t) = -16t^2 + 32t + 20$. Use the values for a, b, and c. $a = -16$, $b = 32$, $c = 20$ and plug it into the formula $t = -\frac{b}{2a}$, this gives you the t value for the vertex, $t = 1$. Now plug that 1 in for all the t's in the original equation. $h(1) = -16(1)^2 + 32(1) + 20 = 36$ DSMA 0303

2. A.

Choice (A) is correct. Of the 20 children, 8 are boys and so $20 - 8 = 12$ are girls. Of the boys, 4 have a speaking part in the play, and of the girls, 8 do not have a speaking part in the play, so $12 - 8 = 4$ girls do have a speaking part. Therefore, $4 + 4 = 8$ of the children have a speaking part. It follows that if a child from the cast of the play is chosen at random, the probability that the child has a speaking part is $\frac{8}{20} = \frac{2}{5}$.

3. A

Choice (A) is correct. The y -intercept of the graph of an equation is the y -coordinate of the point in the xy -plane where the graph intersects the y -axis. Thus the y -intercept can be found by setting $x = 0$ and solving the equation $y = 2(x + 3)(x - 4)$ for y. Therefore, $y = 2(0 + 3)(0 - 4) = -24$ is the y -intercept. DSMA 0301

4. D

Choice (D) is correct. Let n be the number of sandwiches ordered. Then $18 - n$ was the number of soups ordered. Since the sandwiches cost \$7.75 each, the soups cost \$4.50 each and the total cost of all 18 lunches was \$113.50, the equation $113.5 = 7.75n + 4.5(18 - n)$ holds. Distributing gives $113.5 = 7.75n + 81 - 4.5n$, which simplifies to $32.5 = 3.25n$, dividing both sides by the numerical coefficient of n , 3.25. The result is $n = 10$. Therefore, 10 sandwiches were ordered. DSMA 0301

5. B

Choice (B) is correct. Squaring both sides of the equation $\sqrt{5 - x} = 4$ gives $5 - x = 16$, and so $x = -11$. Substituting -11 for x in the original equation, one can see that -11 is a solution of the equation. Therefore, the value of x is -11 . DSMA 0303

6. D

Choice (D) is correct. The coordinates of the origin are (0, 0), and the coordinates of the given point (6, 9). It follows that the slope of the line that contains these two points is $m = \frac{9-0}{6-0} = \frac{9}{6} = \frac{3}{2}$. Therefore, the equation of the line is $y = \frac{3}{2}x + b$. Since b is defined as the y-intercept, and it was given that the line hit the origin that is the y-intercept. $y = \frac{3}{2}x + 0 \rightarrow y = \frac{3}{2}x$ is the equation of the line. DSMA 0301

7. C

Choice (C) is correct. If $\frac{x-1}{x} = 20$, you have to move the x in the denominator, you have to multiply both sides by x . Then $x - 1 = 20x$. It follows that $-1 = 19x$, dividing by the numerical coefficient of x . Therefore $x = -\frac{1}{19}$. DSMA 0303

8. C

Choice (C) is correct. If the length l of the yard is 18 feet longer than the width w of the yard, then $w = l - 18$, and so the perimeter P , which is $P = 2(l + w)$, can be rewritten as $2(l + l - 18) = 2(2l - 18)$. Since the perimeter of the yard is 72 feet, it follows that $2l - 18 = 36$, and so $l = 27$ and $w = 27 - 18 = 9$. Therefore, the area of the yard is $(27)(9) = 243$ square feet. DSMA 0300