

Form REL

Student Name: _____



Georgia High School Graduation Tests

GPS Version

Mathematics

Sample Items



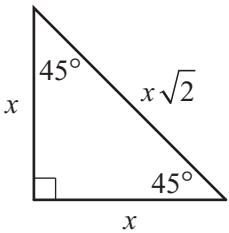
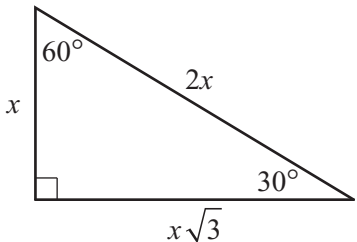
Georgia Department of Education

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**Georgia High School Graduation Tests
Mathematics Formula Sheet**

Below are the formulas you may find useful as you work the problems. However, some of the formulas may not be used. You may refer to this page as you take the test.

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| <p style="text-align: center;">Area</p> <p>Rectangle/Parallelogram $A = bh$</p> <p>Triangle $A = \frac{1}{2}bh$</p> <p>Circle $A = \pi r^2$</p> <p>Trapezoid $A = \frac{1}{2}(h)(b_1 + b_2)$</p> <p style="text-align: center;">Circumference</p> <p>$C = \pi d$ $\pi \approx 3.14$</p> <p style="text-align: center;">Volume</p> <p>Rectangular Prism/Cylinder $V = Bh$</p> <p>Pyramid/Cone $V = \frac{1}{3}Bh$</p> <p>Sphere $V = \frac{4}{3}\pi r^3$</p> <p style="text-align: center;">Surface Area</p> <p>Rectangular Prism $SA = 2lw + 2wh + 2lh$</p> <p>Cylinder $SA = 2\pi r^2 + 2\pi rh$</p> <p>Sphere $SA = 4\pi r^2$</p> <p style="text-align: center;">Trigonometric Relationships</p> <p>$\sin(\theta) = \frac{\text{opp}}{\text{hyp}}; \cos(\theta) = \frac{\text{adj}}{\text{hyp}}; \tan(\theta) = \frac{\text{opp}}{\text{adj}}$</p> <p style="text-align: center;">Special Right Triangles</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>45°–45°–90° Triangle</p>  </div> <div style="text-align: center;"> <p>30°–60°–90° Triangle</p>  </div> </div> | <p style="text-align: center;">Pythagorean Theorem</p> <p>$a^2 + b^2 = c^2$</p> <p style="text-align: center;">Quadratic Formula</p> <p>$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$</p> <p>Standard Form $ax^2 + bx + c = y$</p> <p>Vertex Form $a(x - h)^2 + k = y$</p> <p style="text-align: center;">Expected Value</p> <p>$E(x) = \sum_{i=1}^n x_i p(x_i)$</p> <p>the sum of each outcome multiplied by its probability of occurrence</p> <p style="text-align: center;">Permutations</p> <p>${}_n P_r = \frac{n!}{(n - r)!}$</p> <p style="text-align: center;">Combinations</p> <p>${}_n C_r = \frac{n!}{r!(n - r)!}$</p> <p style="text-align: center;">Interquartile Range</p> <p>the difference between the first quartile and third quartile of a set of data</p> |
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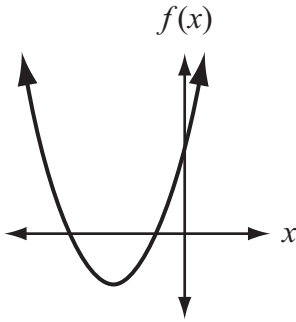
1. The function $g(x) = |x - 5|$ is the result of a translation of the function $f(x) = |x|$. How is the graph of $g(x)$ different from the graph of $f(x)$?
- A. The graph of $g(x)$ is 5 units up.
 - B. The graph of $g(x)$ is 5 units down.
 - C. The graph of $g(x)$ is 5 units to the left.
 - D. The graph of $g(x)$ is 5 units to the right.

2. Which expression is equivalent to $\sqrt{32b^{16}}$?
- A. $16b^4$
 - B. $16b^8$
 - C. $4b^4\sqrt{2}$
 - D. $4b^8\sqrt{2}$

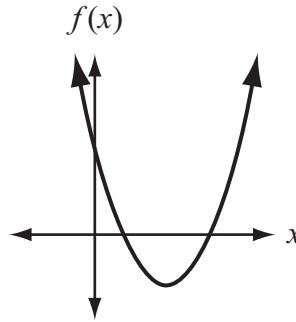
3. A student is studying the quadratic function f . The student determined that $f(0) > 0$. The student also determined that f has two real roots, a and b , such that $a < b < 0$.

Which graph could represent f ?

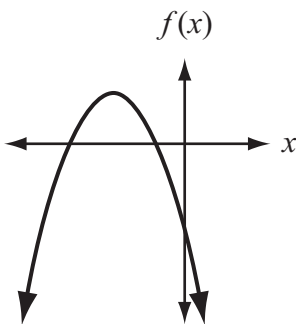
A.



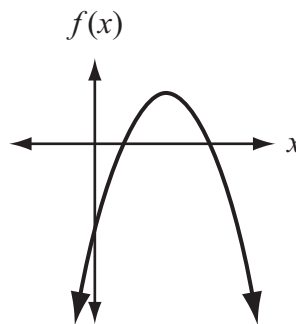
B.



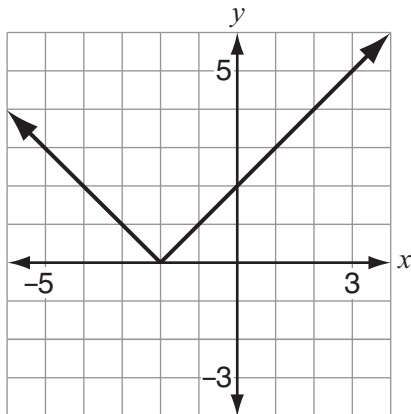
C.



D.



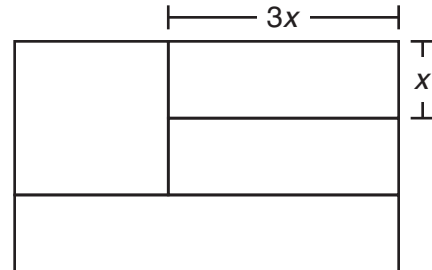
4. A student drew this graph of the function f .



Which value of x satisfies $f(x) = 1$?

- A. $x = -3$
- B. $x = -2$
- C. $x = 1$
- D. $x = 3$

5. The Georgia state flag consists of a square and three rectangles. Each rectangle has the same width, x . The length of each of the two smaller rectangles is equal to $3x$, as shown in this diagram.



The area of this particular Georgia flag is 60 square feet. What is the length of x ?

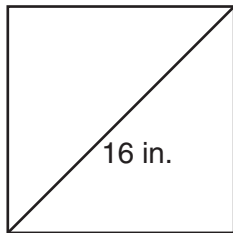
- A. 2 feet
 - B. 4 feet
 - C. $2\sqrt{5}$ feet
 - D. $2\sqrt{15}$ feet
6. Which of these true statements also has a true inverse?
- A. If the product of integers a and b is odd, then both a and b are odd.
 - B. If x is a multiple of 6, then x is an even number.
 - C. If a and b are consecutive integers, then the sum of a and b is odd.
 - D. If p is negative, then $|-p|$ is positive.

7. One interior angle of a pentagon has a measure of 120° . The other four interior angles are congruent to each other.

What is the measure of one of the four congruent angles?

- A. 30°
- B. 60°
- C. 105°
- D. 195°

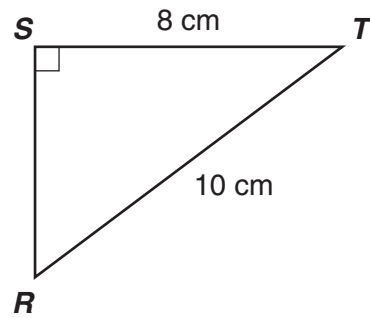
8. This diagram shows a square tile with a diagonal length of 16 inches.



What is the approximate area of the tile?

- A. 64 square inches
- B. 128 square inches
- C. 181 square inches
- D. 256 square inches

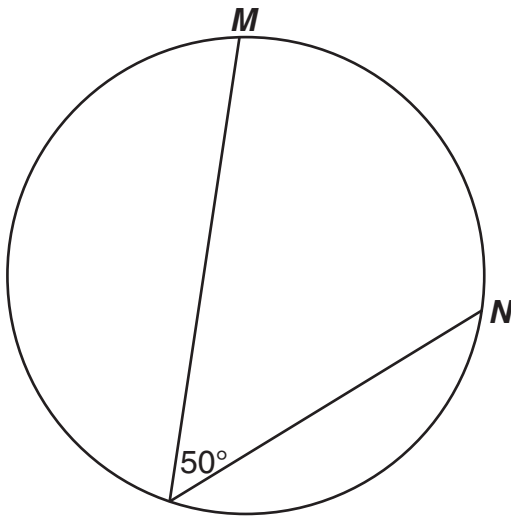
9. A student drew this diagram of a right triangle.



What is the value of the tangent of $\angle R$?

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

10. This circle has a radius of 9 inches.



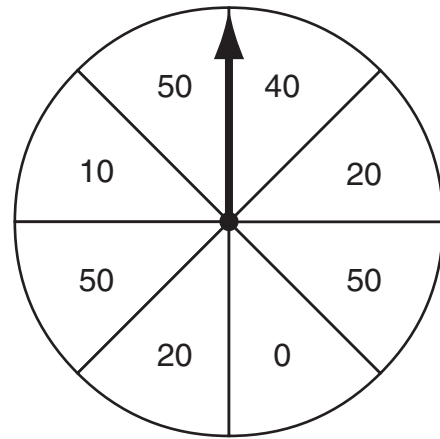
What is the approximate length of arc MN ?

- A. 8 in.
 - B. 16 in.
 - C. 23 in.
 - D. 35 in.
11. There are 10 students who applied for internships. Only 3 positions are available.

How many different groups of 3 can be selected from the 10 students?

- A. 30
- B. 120
- C. 720
- D. 1000

12. Jerry will spin the arrow on this spinner once.



What is the expected value of Jerry's spin?

- A. 20
- B. 25
- C. 30
- D. 50

13. A group of 100 people were asked to rate two restaurants on a scale from 0 to 10. The results are represented by this double box-and-whisker plot.



Which statement is correct?

- A. The range of ratings is greater for Restaurant A than for Restaurant B.
- B. The range of ratings is greater for Restaurant B than for Restaurant A.
- C. The interquartile range of ratings is greater for Restaurant A than for Restaurant B.
- D. The interquartile range of ratings is greater for Restaurant B than for Restaurant A.

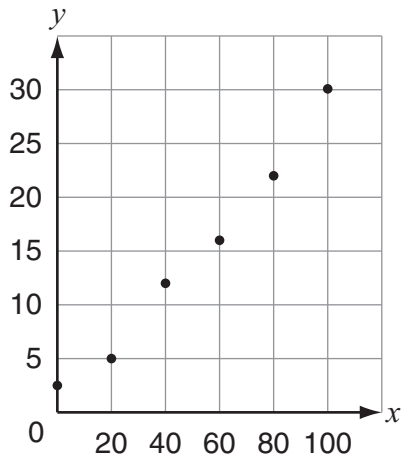
14. A marketing researcher asked a random selection of adults to rate two different brands of toothpaste on a scale from 1 through 10.

- Brand X had a mean rating of 7.5 with a standard deviation of 1.1.
- Brand Y had a mean rating of 6.8 with a standard deviation of 2.0.

Based on the data, which statement **must** be true?

- A. The data is more dispersed for Brand X.
- B. The data is more dispersed for Brand Y.
- C. The range of the data is greater for Brand X.
- D. The range of the data is greater for Brand Y.

15. A student drew this scatter plot.

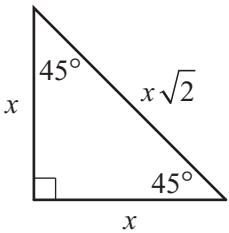
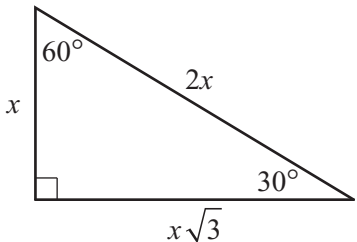


Which equation best models the data in the scatter plot?

- A. $y = 0.1x + 3$
- B. $y = 0.3x + 1$
- C. $y = x + 0.3$
- D. $y = 3x + 0.1$

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