Student Name _____

Georgia End- Of- Course Tests
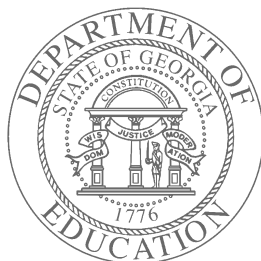
Mathematics I
Algebra/Geometry/Statistics
Released Items

Mathematics I 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.

Area

Rectangle and Parallelogram $A = bh$

Triangle $A = \dfrac{1}{2}bh$

Circle $A = \pi r^2$

Trapezoid $A = \dfrac{1}{2}(h)(b_1 + b_2)$

Circumference

$C = \pi d$ $\pi \approx 3.14$

Volume

Rectangular Prism/Cylinder $V = Bh$

Pyramid/Cone $V = \dfrac{1}{3}Bh$

Surface Area

Rectangular Prism $SA = 2lw + 2wh + 2lh$

Cylinder $SA = 2\pi r^2 + 2\pi rh$

Pythagorean Theorem

$$a^2 + b^2 = c^2$$

Mean Absolute Deviation

$$\frac{\sum\limits_{i=1}^{N} \left| x_i - \bar{x} \right|}{N}$$

the average of the absolute deviations from the mean for a set of data

Expected Value

$$E(x) = \sum_{i=1}^{n} x_i p(x_i)$$

the sum of each outcome multiplied by its probability of occurrence

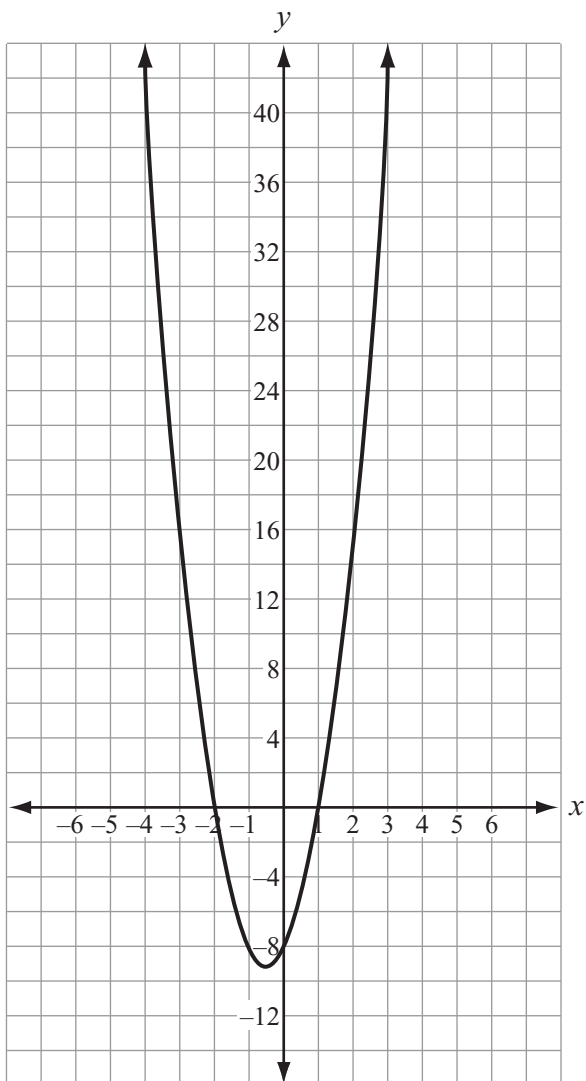## Permutations

$$_nP_r = \frac{n!}{(n-r)!}$$

Combinations

$$_nC_r = \frac{n!}{r!(n-r)!}$$

Interquartile Range

the difference between the first quartile and third quartile of a set of data

1 **This graph shows a quadratic equation.**

What are the solutions to the equation?

A $x = -8$ only
B $x = 2$ only
C $x = -2$ and $x = 1$
D $x = -8, x = -2,$ and $x = 1$

2 **Which expression is equivalent to $(2-x)^3$?**

A $6 - x^3$
B $8 - x^3$
C $1 - 3x - 3x^2 - x^3$
D $8 - 12x + 6x^2 - x^3$

3 **The area of a rectangle is $b^2 - 5b - 24$ square centimeters. Its width is $b+3$ centimeters.**

Which expression represents the length, in centimeters, of the rectangle?

A $b - 8$
B $b + 8$
C $b - 15$
D $b + 15$

4 **Which expression is equivalent to $2a^3 - 4a^2 - 30a$?**

A $2a(a+3)(a+5)$
B $2a(a-3)(a+5)$
C $2a(a+3)(a-5)$
**D** $2a(a-3)(a-5)$

Go On

5 **This function models the height, $h(t)$, of a ball t seconds after it is kicked into the air.**

$$h(t) = -16t^2 + 64t$$

What does each zero of this function represent?

A the minimum height of the ball
B the maximum height of the ball
C the times at which the ball is on the ground
D the time the ball reaches its maximum height

6 **This diagram shows the dimensions of a cardboard box.**

$x + 2$ feet

x feet

$3x$ feet
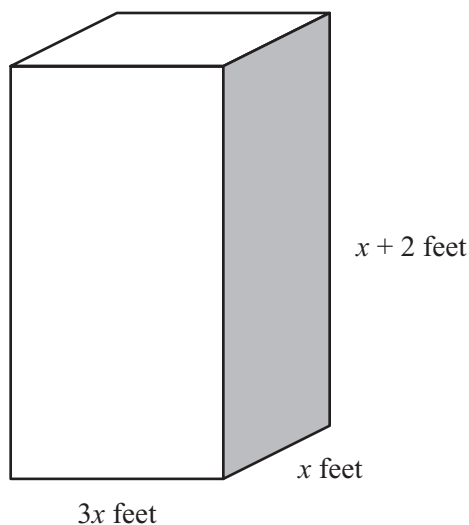
Which expression represents the volume, in cubic feet, of the box?

A $3x^3 + 2$
B $5x^3 + 2$
C $3x^3 + 6x^2$
D $5x^3 + 6x^2$

7 **Some rocks fell 128 feet off a cliff. The number of seconds, t, it took for each rock to reach the ground is modeled by this equation.**

$$-16t^2 + 128 = 0$$

What positive value of t solves this equation?

A 2 seconds
B $2\sqrt{2}$ seconds
C 4 seconds
D $4\sqrt{2}$ seconds

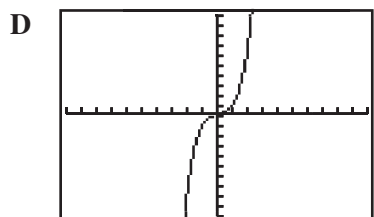**8** **A quadratic function has this domain and range.**
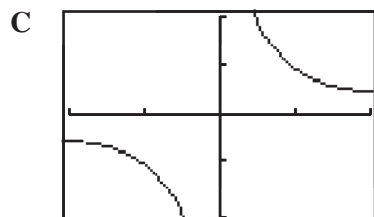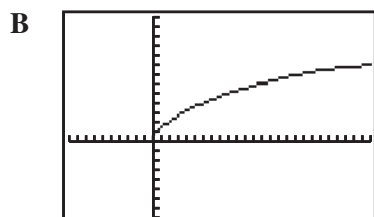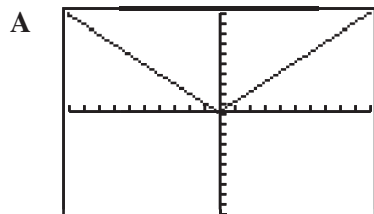
- **domain: {all real numbers}**

- **range: {all real numbers greater than 1}**

How many real zeroes does the function have?

A 0
B exactly 1
C at least 1
D exactly 2

Go On

9 Alan wants to graph the function $f(x) = |x|$ on a graphing calculator.

Which of the following shows the graph of this function?

A

B

C

D

10 What are the zeros of the function $f(x) = x^2 + 5x - 24$?

A $x = -6$ and $x = 4$
B $x = -3$ and $x = 8$
C $x = 3$ and $x = -8$
D $x = 6$ and $x = -4$

11 A street map is placed on a coordinate grid. The length of each square on the grid is 100 yards. Main Street is represented by the line $y = -2$ on the grid.

- The coordinates of Chad's business are $(-5, 2)$.

- The coordinates of Dwayne's business are $(-2, -6)$.

Chad walks the SHORTEST distance from his business to Main Street. Then he walks the SHORTEST distance from where he is on Main Street to Dwayne's business. How many yards does Chad walk?

A 800
B 900
C 1000
D 1100

Go On

Use this information to answer question 12.

This coordinate grid shows the flag pattern Heather drew.
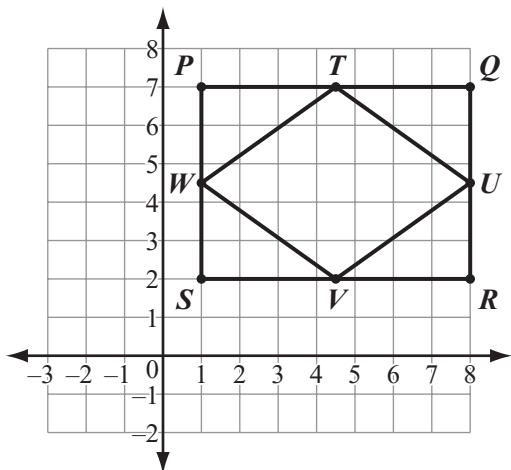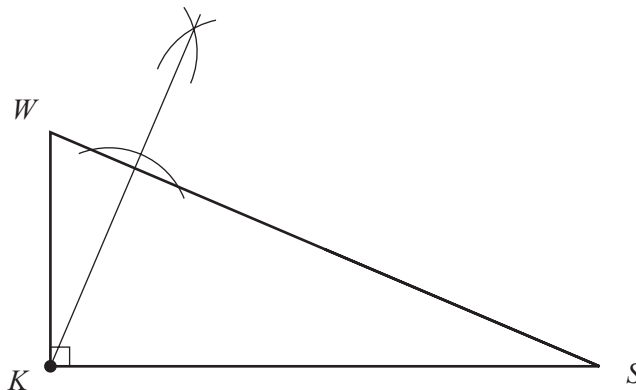

Points *T*, *U*, *V*, and *W* are the midpoints of the sides of quadrilateral *PQRS*. Each unit on the grid represents one inch.

12 **What is the perimeter of quadrilateral *TUVW*?**

    A   14 inches
    B   14.1 inches
    C   17.2 inches
    D   24 inches

13 **This diagram shows how Pam used a compass and a straightedge to construct *K*, a point of concurrency for right triangle *WKS*.**


What point of concurrency did Pam construct?

    A   centroid
    B   circumcenter
    C   incenter
    D   orthocenter

14 **The lengths of two sides of a triangle are $2n$ and $n-3$ units, where $n > 3$.**

Which inequality represents all possible lengths, *x*, for the third side of the triangle?

    A $n+3 < x < 3n-3$
    B $n-3 < x < 3n+3$
    C $n-3 < x < 2n$
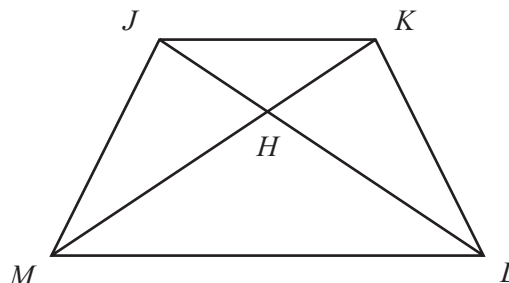   **D** $2n < x < 3n-3$

Go On

15 A construction crew plans to build a shopping center that is equidistant from the three towns shown on this coordinate map.
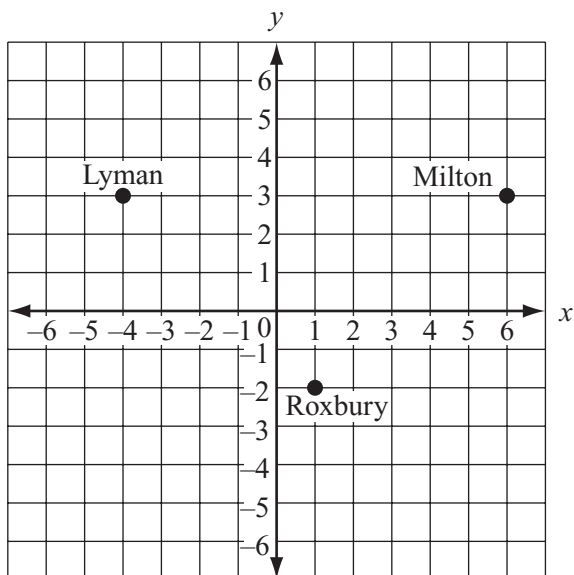
What are the coordinates of the point where the shopping center will be built?

A (0, 1)

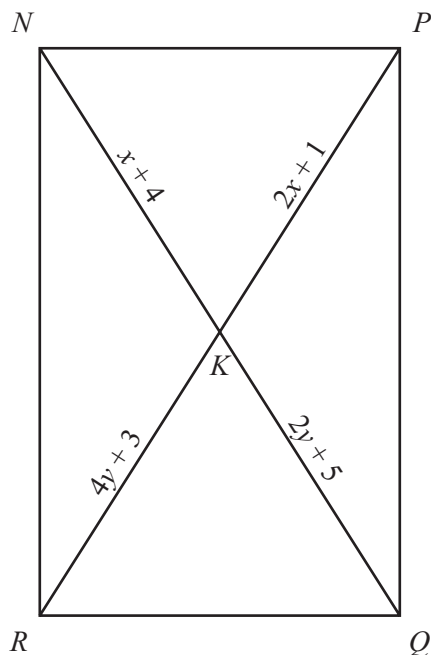**B** (0, 2)

C (1, 2)

D (1, 3)

16 In this figure, Gabrielle wants to prove that $\triangle JLM \cong \triangle KML$. She knows that $\overline{JM} \cong \overline{KL}$.

What additional piece of information will allow Gabrielle to complete the proof?

A $\overline{JL} \cong \overline{KM}$

B $\overline{ML} \cong \overline{KM}$

C $\overline{JH} \cong \overline{HK}$

D $\overline{MH} \cong \overline{LH}$

Go On

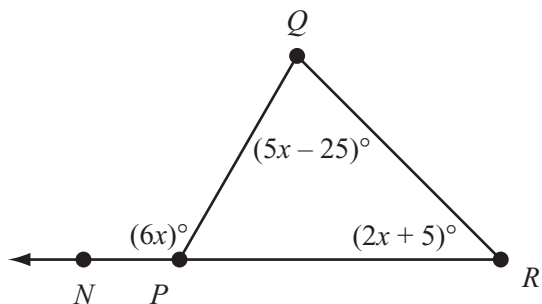**17** In this diagram, *NPQR* is a rectangle.

What is the length, in units, of $\overline{NQ}$?

A 1
B 3
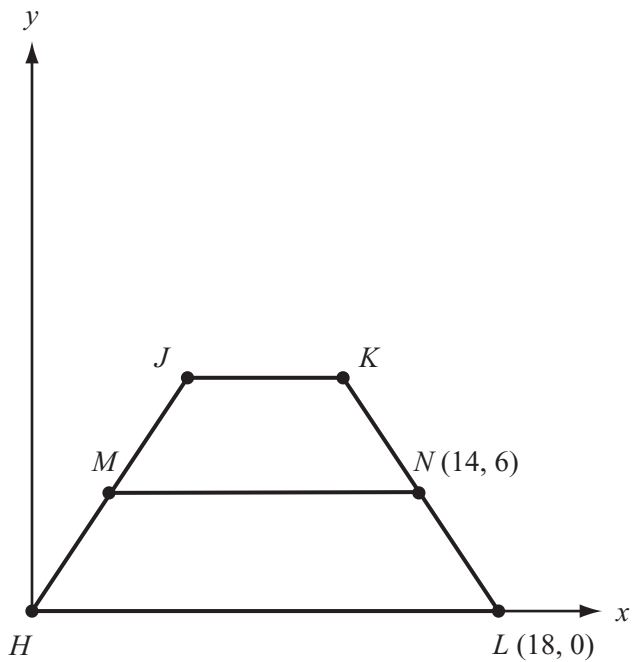C 7
D 14

18 Use this diagram to answer the question.

What is the measure of ∠*QPR*?
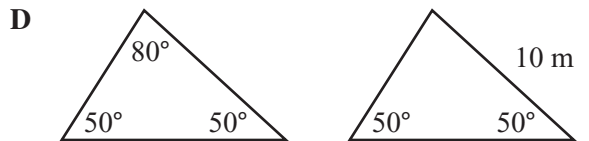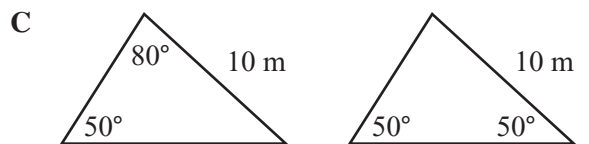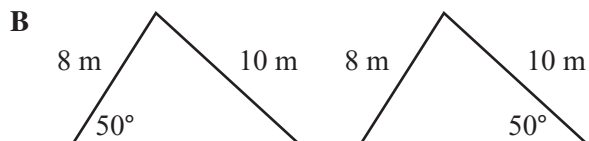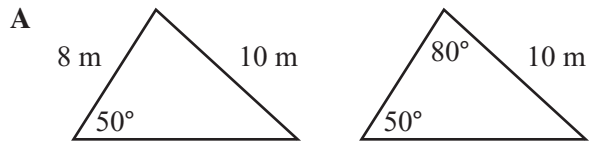
A   15°
B   60°
C   120°
D   175°

Go On

19 Trapezoid *HJKL* is shown on this coordinate grid. $\overline{MN}$ connects the midpoints of $\overline{JH}$ and $\overline{KL}$.

What are the coordinates of vertex *K*?

A   (8, 9)
B   (9, 8)
C   (10, 12)
D   (12, 10)

20 Which pair of triangles could be proved congruent?

A

B

C

D

Go On

21 Seth places 7 red cards, 9 blue cards, and 4 yellow cards in a bag. All the cards are the same size and shape. He randomly selects a card. It is yellow. He does not replace it.

Seth will randomly select a second card from the bag. What is the probability that he will select a blue card?

A $\dfrac{9}{19}$

B $\dfrac{9}{20}$

C $\dfrac{1}{5}$

D $\dfrac{1}{9}$

22 Beth has this spinner which is divided into seven congruent sections. Each section is labeled with a day of the week.
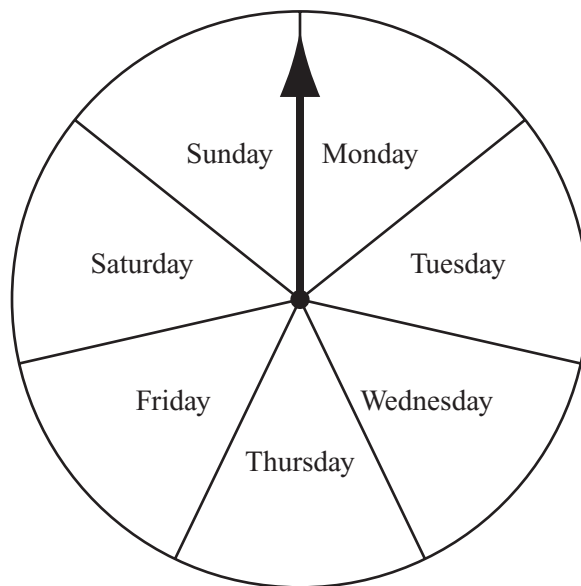
Beth will spin the arrow on the spinner two times.

What is the probability that the arrow will land on either Saturday or Sunday both times?

A $\dfrac{3}{49}$

B $\dfrac{4}{49}$

C $\dfrac{2}{7}$

D $\dfrac{4}{7}$

23 A teacher determined the median scores and interquartile ranges of scores for a test she gave to two classes.

- In Class 1, the median score was 70 points, and the interquartile range was 15 points.

- In Class 2, the median score was 75 points, and the interquartile range was 12 points.

- Both classes had the same third quartile score.

Which range includes only the numbers that could be third quartile scores for BOTH classes?

A 70 to 87 points
B 70 to 85 points
C 75 to 87 points
D 75 to 85 points

24 A spinner has three sections, each with different point values and areas.

- The 1-point section is $\frac{2}{3}$ the area of the spinner.

- The 2-point section is $\frac{1}{4}$ the area of the spinner.

- The 3-point section is $\frac{1}{12}$ the area of the spinner.

To the nearest tenth of a point, what is the expected value on any one spin?

A 0.7
B 1.4
C 2.0
D 6.0

25 What is the mean absolute deviation of the set {12, 10, 14, 4, 5}?

A 18.0
B 9.0
C 3.6
D 1.8

26 Greg wrote the numbers 1 through 9 on pieces of paper and placed them in a hat. He will randomly select one piece of paper from the hat. He will not replace it. Greg will then randomly select a second piece of paper from the hat.

What is the probability that Greg will select a piece of paper with an odd number on it and then select one with an even number on it?

A $\frac{20}{81}$

B $\frac{5}{18}$

C $\frac{9}{17}$

D $\frac{19}{18}$

Go On

Use the information to answer questions 27 through 29.

Adrian is the manager at a television station. She has selected 4 comedies and 3 talk shows to fill 7 half-hour daytime slots. None of the programs will be repeated during the day.

27 In how many different ways can Adrian arrange the 7 programs in the first two time slots?

    A 14
    B 21
    C 42
    D 49

28 How many different 4-program combinations can Adrian select from the 7 programs?

    A 28
    B 35
    C 210
    D 840

29 Adrian will select 2 comedies and 1 talk show to fill the first three time slots. How many different combinations of 2 comedies and 1 talk show can Adrian select from the 7 programs?

    A 9
    B 18
    C 36
    D 48

30 Harrison has a spinner that is divided into 15 congruent sections. It has 6 red sections, 8 blue sections, and 1 yellow section.

Harrison will spin the arrow on the spinner one time. What is the probability that the arrow will land on either a blue section or a yellow section?

    A $\dfrac{1}{15}$

    B $\dfrac{1}{9}$

    C $\dfrac{8}{15}$

    D $\dfrac{3}{5}$

STOP

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$$_nC_r = \dfrac{n!}{r!(n-r)!}$$

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