

Measurements of Student Progress Grade 8

2 Look at the figure on the grid.



Which grid represents a 90° clockwise rotation (turn) of the figure about point **P**?



12 Barett does not understand what an object looks like after a translation (slide). His sister showed him by moving a picture into different positions.

Which picture shows an example of a translation?





23 Alissa framed a picture for her mother. She placed the picture as shown in the frame. She wants the top of the head in the picture to be at the top of the frame.



How many degrees counterclockwise will she need to rotate (turn) the picture so that the top of the picture is at the top of the frame?

- \bigcirc **A.** 90°
- **B.** 180°
- \bigcirc C. 270°
- **D.** 360°



28 Jackson is looking at a picture.



He sees another picture and notices the same bus is facing in the opposite direction.



How would Jackson describe the change in position of the bus from the first picture to the next?

- \bigcirc **A.** A reflection (flip)
- \bigcirc **B.** A translation (slide)
- \bigcirc **C.** A 90° rotation (turn)
- \bigcirc **D.** A 180° rotation (turn)

2 Write the inequality below in words.

a ≤ 2



Graph the inequality on the number line. Label the intervals.



5 Ms. Parker conducted a survey of the students in her class to see how many liked rock or country music. The results of her survey are shown below:



25 students took the survey.22 students said they liked rock.14 students said they liked country.



How many students said they liked **both** rock and country music? Explain your reasoning. Be sure to clearly label any diagrams or work included in your explanation.

How many students said they liked both rock and country music? _____

2 Sylvia and Alex are playing tic-tac-toe on their game board.



Which picture shows how the game board would look after being rotated (turned) 90° clockwise?



2 The state wants to build a straight road so there is a direct route from North Town to East Town.



How long will the road be between North Town and East Town?

- **A.** 13 miles
- **B.** 15 miles
- \bigcirc C. 54 miles
- **D.** 63 miles

4 Mary is making a maple leaf quilt. The directions in her quilt book state: "Rotate maple leaf M 90° clockwise around the tip of the stem and then translate the rotated leaf down 4 inches."



Draw the resulting leaf on the grid.

4 A store at the mall is giving a "Spring Break" prize to a randomly selected student and a randomly selected teacher at a middle school.

Faye predicts the prizes will go to a female student **and** a male teacher.

	Students	Teachers
Female	360	24
Male	240	6
Total	600	30

Population at a Middle School

What is the probability that Faye is correct?



Key: B





First reflect the isosceles triangle across the *x*-axis. Then translate it 12 units to the left.

Which ordered pair represents the new coordinate for vertex S?

- O **A.** (−3, −2)
- **B.** (9, −2)
- C. (−9, −2)
- **D.** (−3, 2)

Key: A

20 Mrs. Bartilotta's mathematics class has 7 girls and 3 boys. She will randomly choose two students to do a problem in front of the class.

What is the probability that she will choose 2 boys?

 $\bigcirc A. \quad \frac{1}{15} \\ \bigcirc B. \quad \frac{2}{5} \\ \bigcirc C. \quad \frac{3}{7} \\ \bigcirc D. \quad \frac{5}{19} \\ \end{vmatrix}$

Key: A

25 Darin played a game with two spinners. The game is played by spinning each spinner and then adding the two resulting numbers. The goal is to spin two numbers that add up to eleven.



What is the probability that Darin will spin two numbers that add up to eleven?

 $\bigcirc A. \quad \frac{1}{3} \\ \bigcirc B. \quad \frac{1}{10} \\ \bigcirc C. \quad \frac{3}{5} \\ \bigcirc D. \quad \frac{3}{10} \\ \end{vmatrix}$



39 Meara is making a food-guide pyramid for health class. She needs the measurements of this picture to enlarge it for a poster.



Meara's Food-Guide Pyramid

Which expression represents the length of line segment AB?

 $\bigcirc A. \ \sqrt{(5+8)^2}$ $\bigcirc B. \ \sqrt{5^2+8^2}$ $\bigcirc C. \ \sqrt{5^2}+\sqrt{8^2}$ $\bigcirc D. \ \sqrt{2\times5+2\times8}$



Reminder: Use a No. 2 pencil only. Do not use a mechanical pencil or pen.

1 Henrietta is stacking soup cans for a display in the grocery store where she works. The bottom level of the display has 100 cans arranged in a square. The next level up has 81 cans in a square. The level above that has 64 cans in a square. She continues this pattern until she has just one can at the top.

How many cans does she have altogether in this display?

O A. 246

O B. 385

 \odot C. 450

O D. 550

Кеу: В

11 Joseph and Cindy made up a game in their mathematics class. To earn points in the game each player rolls a six-sided cube with numbers 1 through 6 on the sides and then flips a coin. When the coin lands "tails up," the player gets a total number of points equal to the number at the top of the cube. When the coin lands "heads up," the player's points are doubled for that turn.



In the box below list all the possible outcomes for each turn. Then indicate the probability of a player getting 6 points in one turn.

15 Each letter in the diagram represents an angle.



Which of the following statements is true?

- \bigcirc A. x + z = y + z
- \bigcirc B. w + x > y + z
- \bigcirc C. w + x + y = y + z
- \bigcirc D. w + x + y < y + z





19 Look at the graph. The figure will be reflected over the y-axis.

What will be the new coordinates of point *D*?

- O **A.** (6, 2)
- O **B.** (-6, -2)
- O **C**. (2, 6)
- O **D**. (-2, -6)

Key: B

26 Look at the figure on the grid.



When the figure is translated so that point *C* is moved to the origin, and point *D* is moved to the *x*-axis, what are the new coordinates of point *A*?

- O A. (-9, -6)
- O B. (-4, -8)
- O **C**. (-3, -9)
- O D. (-8, -4)



29 Look at the chart.

Planet Mass	
Mercury	3.30 x 10 ²³ kg
Venus	4.87 x 10 ²⁴ kg
Earth	5.97 x 10 ²⁴ kg
Mars	6.42 x 10 ²³ kg

Which planet has the largest mass?

- O A. Mercury
- O B. Venus
- O C. Earth
- O D. Mars

Key: C

35 Naomi and Dana did the following computation.

3 x 4² + 7

Naomi's answer was 55. Dana's answer was 151.

Which student's answer is correct? Describe the other student's error.

Which student's answer is correct?

- **41** Anita and Ajay play a game of chess. The probability that Anita will win is 48%, and the probability that Ajay will win is 42%. What is the probability that this game will end in a stalemate (tie)?
 - O **A.** 6%
 - O **B.** 10%
 - O **C.** 52%
 - O **D.** 58%

Кеу: В

- **42** Jeremiah is doing an experiment in his mathematics class. He flips four pennies in the air. What is most likely to happen?
 - O A. Two of the pennies will be heads and two will be tails.
 - O **B.** Three of the pennies will be heads and one will be tails.
 - O C. All four pennies will be heads.
 - O **D.** None of the pennies will be heads.

Key: A

1 The park biologist reported the deer tick population in the park was estimated at 9.65×10^5 .

What was the population estimate in standard notation?

A. 0.0000965B. 0.000965

- **C.** 96,500
- **D.** 965,000

Item Information

Score Points: 1

Key: D

Tools: N

Strand and Target NS01 (Number and Numeration): Demonstrate understanding of the concepts and symbolic representations of rational numbers including whole number powers, square roots of perfect squares, and numbers written in scientific notation; demonstrate understanding of the relative values of rational numbers including whole number powers and square roots of perfect squares; demonstrate understanding of and use the distributive property and properties of addition and multiplication with rational numbers including integers (1.1.1, 1.1.2, 1.1.3)

2 Jeremy wanted to determine how many of the 972 students at East High School have dogs. Jeremy surveyed 54 students.



East High School / Pet Ownership Society

Based on the survey results, which is the **best** prediction of the total number of students in the school who have dogs?

O A. 144

- **B.** 216
- C. 360
- **D.** 432

Item Information

Score Points: 1

Key: C

Tools: Y

Strand and Target NS02 (Ratio and Proportion): Demonstrate understanding of and apply the concepts of ratio, percent, and both direct and inverse proportion (1.1.4)

3 In a given year the United States had 6.93×10^{11} dollars in circulation. Of that amount, 3.30×10^{10} dollars were coins and the rest was paper money.

Which expression represents the amount of paper money in circulation?

 $\bigcirc A. \quad 3.63 \times 10^{1}$ $\bigcirc B. \quad 3.63 \times 10^{10}$ $\bigcirc C. \quad 6.60 \times 10^{11}$ $\bigcirc D. \quad 6.90 \times 10^{10}$

Item Information

Score Points: 1

Key: C

Tools: N

Strand and Target NS04 (Computation): Complete multi-step computations with combinations of rational numbers including integers, whole number powers, and square roots of perfect squares, using order of operations (1.1.6)

8 Vance graphed the relation between fund-raising profits for the chess club and the number of members.



Chess Club Fund-raising

Which equation represents the data displayed on the graph?

 $\bigcirc A. \quad y = 29n + 180$ $\bigcirc B. \quad y = 60n + 180$ $\bigcirc C. \quad y = \frac{2}{3}n + 180$ $\bigcirc D. \quad y = \frac{200}{3}n + 180$

Item Information

Score Points: 1

Key: A

Tools: X

Strand and Target PS03 (Data Representation and Interpretation): Draw a reasonable line to describe the data represented by a scatter plot and determine whether a straight line is an appropriate way to describe the trend in the data; read and interpret data presented in tables of ordered pairs and scatter plots and make predictions based on the given data; use statistics to support different points of view or evaluate a statistical argument based on data (1.4.5, 1.4.6)

15 Ms. Parker gave her students this picture of a rectangular prism:



What is the surface area of the rectangular prism?

Show your work using words, numbers, and/or diagrams.

 What is the surface area of the rectangular prism? ______

Item Information

Score Points: 2

Tools: N

Strand and Target ME03 (Procedures): Use formulas, *including the Pythagorean Theorem*, to determine measurements of *triangles*, prisms, or cylinders (1.2.5)

1 A tissue can be 0.000075 meters thick.



Which expression represents 0.000075 in scientific notation?

 $\bigcirc A. \quad 7.5 \times 10^{5}$ $\bigcirc B. \quad 7.5 \times 10^{-5}$ $\bigcirc C. \quad 75 \times 10^{6}$ $\bigcirc D. \quad 75 \times 10^{-6}$

27089

Item Information

Score Points: 1

Key: B

Tools: N

Strand and Target NS01 (Number and Numeration): Demonstrate understanding of the concepts and symbolic representations of rational numbers including whole number powers, square roots of perfect squares, and numbers written in scientific notation; demonstrate understanding of the relative values of rational numbers including whole number powers and square roots of perfect squares; demonstrate understanding of and use the distributive property and properties of addition and multiplication with rational numbers including integers (1.1.1, 1.1.2, 1.1.3)

4 When the figure below is rotated 90° **counterclockwise** about the origin, what would be the new coordinates of point *C*?



○ A. (-5, 3)
○ B. (3, -5)
○ C. (5, -3)

D. (5, 3)

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Item Information

Score Points: 1

Key: A

Tools: X

Strand and Target GS02 (Locations and Transformations): Use geometric properties to describe or identify the location of points on coordinate grids; use multiple transformations including translations, reflections, and/or rotations to create congruent figures (1.3.3, 1.3.4)

5 In a certain game, the contestants shut their eyes and draw either a shaded cube or a white cube from a box. A contestant cannot return the cube after drawing it from the box. The box contains the cubes shown in the diagram.



What is the probability that a contestant will draw a shaded cube on 2 consecutive draws?

 $\bigcirc A. \quad \frac{3}{14} \\ \bigcirc B. \quad \frac{1}{4} \\ \bigcirc C. \quad \frac{1}{2} \\ \bigcirc D. \quad \frac{7}{15} \\ \end{vmatrix}$

03516

Item Information

Score Points: 1

Key: A

Tools: X

Strand and Target PS01 (Probability): Demonstrate understanding of the concepts of compound, dependent and independent events; determine and use probabilities of compound, dependent, and independent events (1.4.1, 1.4.2)

9 A certain school has 12 mathematics teachers and only 3 types of mathematics courses—algebra, geometry, and calculus. Two of the teachers teach only algebra. Eight teachers teach geometry, and six teach calculus.

How many teachers teach both geometry and calculus?

Clearly explain or show how you arrived at your answer.



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Item Information

Score Points: 2

Tools: X

Strand and Target SR02 (Construct Solutions): Select and organize relevant information; use appropriate concepts and procedures from number sense, measurement, geometric sense, probability and statistics, and algebraic sense; use a variety of strategies and approaches; determine whether a solution is viable, mathematically correct; and answers the question(s) asked (2.2.1, 2.2.2, 2.2.3, 2.2.4)