Sam Cota Worksheet 2.1: My Family Testing Advantages in re: Building, Measurement

Here you will find test questions that Sam is more likely to know something about because he is are part of a family that knows certain things well. For instance, Sam heard many stories when his dad got home from work. Sam's dad worked with him on his homework like math and science and history. Sam's father taught Sam how to build things beginning with the basic skills like measuring things right and then more advanced skills (like in the tests from 3rd grade to high school). Sam visited him at work. Sam worked for him when he was older, starting as a laborer and learning from the ground up. Sam and his father and sisters built their house in Maine.

1) What is a short story from Worksheet One?

My father was a great builder and built a lot of buildings. He taught me and my sisters how to build things with wood. He was especially proud when we learned to measure things right, to the 64th of an inch, even, as he always said that was the sign of the best carpenters. Things would never break if we did it right.

2) Pick one fact from this story.

My father knew how to build anything, and he even built our house.

3) Choose a single word or term that is important to the story.

building

4) Go to a test-question bank[1] site [2] and look it up. Try answering any questions that you find.[3]

---

[1] Go to "If You Want to Go Straight to the Tests" in "By Way of Introduction"

[2] The questions below are from a Massachusetts (MCAS) Test Bank that is a few years old (http://www.doe.mass.edu/mcas/search/). When these were used, Wheelock College had permission from Superintendant David Driscoll as secured to Dean Donna McKibbens for use in any teacher testing preparation. This arrangement is now likely moot, and copyright is, as it was then, to Now many of these are collected on the MCAS Resource Center, Any of these questions are illustrative of what the search term "building" will bring up on multiple tests across the land.

[3] Unlike 'sample test" items, some or all "released items" are available after students have taken that season's tests, making this a goldmine for those preparing for them. All sites have answers, best found on the searchable sites. In this worksheet are most of the MCAS released items over the whole course of this particular timeframe. They were searched in terms of seasons, grade-levels, and topics. (Questions below are usually given in rough relationship to grade level, but don't get hung-up there as all age-levels are useful as you build or rebuild your knowledge.) On the website you can see the answers (see "show answer" below for what to look for. You also have "see student work" examples at different levels of ability Click in "View Student Work" to see some of those.

Keep track of your studies. Do so in any way you wish, but do it. You'll be glad.

39 questions came up for "building." I chose some and pasted them here.

5) Interconnected terms will come up as you search. Add them to your (re)collection.[4]

I also found 147 questions about measurement. Some are the same, but a lot are new. Measurement seems to be a big part of a lot of different studies. Maybe that's why Dad started us out on being good measurers.

I just pasted them here starting around page 6.

6) Keep going until you are done, or want to change it up, or can't find anything else. Then, go to another Worksheet 2. Do not rinse. Repeat.

I tried keywords expert, artisan, carpenter. No results! Maybe other kinds of tests have that, like I think the international test has more problems to solve that everyone in the world can answer whether they speak English or not. (I think the tests may be only in English?!) I did hear that they want kids to solve the problems of the world more than for other tests.

See my Worksheet 2.2 (shape = 157 questions)

Questions on Building

2016 Spring Release, Mathematics - Grade 10
Question 36: Open-Response

Reporting Category: Algebra and Functions [Mathematics]
Standard: 10.P.8 - Solve everyday problems that can be modeled using systems of linear equations or inequalities. Apply algebraic and graphical methods to the solution. Use technology when appropriate. Include mixture, rate, and work problems. (AI.P.12)
Standard: CCSS.Math.Content.HSA-CED.A.3 - Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable

---

[4] Some words yield a little, some a lot. Play around with versions of the word. If you don't find any questions to words you choose, you can experiment with any other stories that are familiar to you from your own life and times. As you get more familiar with the databanks, you will start to see the types of words that yield lots of questions. Enjoy the hunt for more things you know, never knew you wanted to know, need to know, and now can find out.

or non-viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.**

A construction contractor received two deliveries of building supplies from a lumberyard. The two deliveries included 10 boxes of nails, which cost a total of $110.

The table below shows the numbers of sheets of plywood, trim boards, and boxes of nails delivered, and the total cost of each delivery.

a. Write and solve an equation to determine n, the cost in dollars of one box of nails.

b. Using your answer from part (a) and the information from the table, create a system of equations that can be used to determine x, the cost in dollars of one sheet of plywood, and y, the cost in dollars of one trim board.

c. Determine the cost in dollars of one sheet of plywood and the cost in dollars of one trim board. Show or explain how you got your answer.

	Sheets of Plywood	Trim Boards	Boxes of Nails	Total Cost ($)
First Delivery	6	40	5	609
Second Delivery	8	20	5	527

The contractor has an additional $200 to spend. She tells her assistant to order at least 5 trim boards and as many sheets of plywood as possible with this money.

d) What is the maximum number of sheets of plywood that the assistant could order following the contractor's instructions? Show or explain how you got your answer.

2015 Spring Release, Technology/Engineering - High School
Question 24: Multiple-Choice

Reporting Category: Construction and Manufacturing
Standard: 2.6 - Recognize the purpose of zoning laws and building codes in the design and use of structures.

Homeowners adding a new bathroom to their house are required by law to get a building permit before work is started. Which statement best describes the purpose of building permits for construction in existing homes?

A. Building permits provide homeowners with assistance in planning construction.

B. Building permits ensure that all construction work meets building codes for safety.

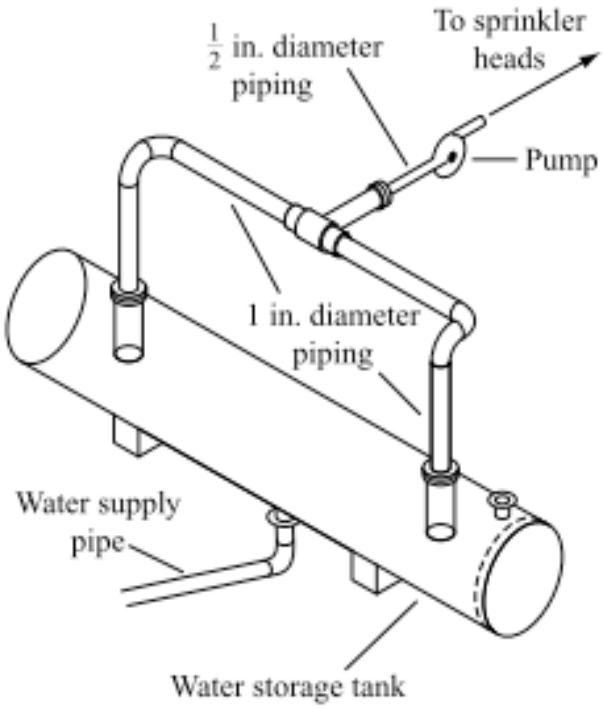
C. Building permits provide construction services to homeowners who are doing their own construction work.

D. Building permits ensure that the construction project will make the home more appealing to future homeowners.

2015 Spring Release, Technology/Engineering - High School
Question 44: Open-Response

Reporting Category: Fluid and Thermal Systems
Standard: 3.5 - Identify and explain sources of resistance (e.g., 45¿ elbow, 90¿ elbow, changes in diameter) for water moving through a pipe.

The diagram below shows a storage tank, piping, and a pump for a building's sprinkler system. The sprinkler system is located in the ceiling.



When the sprinkler system is on, water is pumped from the storage tank through the building's ceiling piping to the sprinkler heads.

1. Identify the sprinkler system as an open system or a closed system. Explain your answer.
2. Describe how the decrease in pipe diameter, from 1 in. to 1/2 in., affects the resistance to water flow as water moves through the pipes.
3. Describe one advantage and one disadvantage of using copper piping instead of PVC piping for the sprinkler system.

2015 Spring Release, Mathematics - Grade 7
Question 8: Multiple-Choice

Reporting Category: Expressions and Equations
Standard: CCSS.Math.Content.7.EE.B.4 - Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

$5t + 15 \leq 140$

$15t + 5 \geq 140$

$15t + 5 \leq 140$

A building code allows a maximum of 140 people in a meeting room. There is one large table in the room, along with some small tables. When filled, the large table seats 15 people, and the small tables each seat 5 people.

Which of [these equations at left] can be used to find t, the greatest number of small tables that can be filled when the large table is also filled?

2015 Spring Release, Technology/Engineering - High School
Question 43: Multiple-Choice

Reporting Category: Construction and Manufacturing
Standard: 2.4 - Calculate the resultant force(s) for a combination of live loads and dead loads.

The total load on a building floor is 60 lb. per sq. ft. The dead load is 40 lb. per sq. ft. What is the live load on the floor?

A. 20 lb. per sq. ft.

B. 40 lb. per sq. ft.

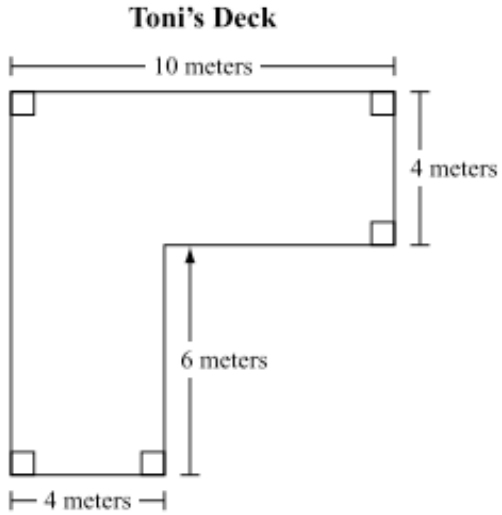
C. 60 lb. per sq. ft.

D. 100 lb. per sq. Ft,

2015 Spring Release, Mathematics - Grade 3
Question 16: Multiple-Choice

Reporting Category: Measurement and Data
Standard: CCSS.Math.Content.3.MD.C.7 - Relate area to the operations of multiplication and addition.

Toni drew a diagram of the deck she is building, as shown below.



What is the area of the deck Toni is building?

A. 24 square meters

B. 40 square meters

C. 64 square meters

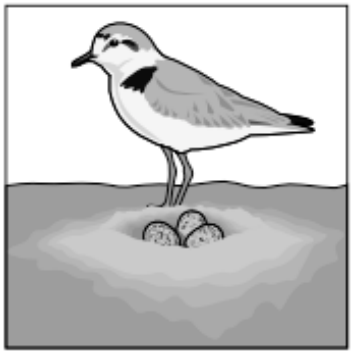
D. 80 square meters

2016 Spring Release, Biology - High School
Question 45: Open-Response

Reporting Category: Ecology
Standard: 6.1 - Explain how birth, death, immigration, and emigration influence population size.

The western snowy plover is a small bird that makes its nest in the sand on ocean and river shores. The snowy plover's breeding season is from March to September. A plover typically lays three eggs each year. If disturbed, it will often abandon its nest. A snowy plover and its nest are shown below.

View Student Work



Compare the birth rate (number of eggs hatched) to the death rate in a population of snowy plovers that is increasing in size.

In an initial population of 100 snowy plovers, there were 30 births and 20 deaths in one year. Based only on the birth and death rates, identify the expected size of the snowy plover population at the end of the year.

At the end of the year, there were actually 80 snowy plovers in the population. Assuming there were no additional births or deaths, explain why the actual population size differed from the expected population size.

Current efforts to conserve plover populations include building wire fences around their nests and making certain beaches off-limits to people during plover breeding season. Explain why making certain beaches off-limits during plover breeding season is a more effective conservation method than building fences around plover nests.

2014 Spring Release, Technology/Engineering - High School
Question 23: Open-Response

Reporting Category: Engineering Design
Standard: 1.4 - Interpret and apply scale and proportion to orthographic projections and pictorial drawings (e.g., 1/4" = 1'0", 1 cm = 1 m).

A company is planning to construct a small building and needs a scale drawing of the floor plan. Information about the building... below.

The building will be 42' × 60'. The 60' walls will run east to west. Inside the building there will be three areas:

- a 42' × 42' work area with four 6' wide doors, forming two 12' wide openings in the south wall
- an 18' × 21' office with a 3' wide door in the south wall
- an 18' × 21' storeroom with no exterior doors

The office will have 3' wide doors to the work area and the storeroom. The storeroom will have a 3' wide door to the work area.

On the grid in your Student Answer Booklet, make a scale drawing of this floor plan. Use the scale 1/6 = 3'. On the grid, 6 squares = 1 inch. Disregard wall thickness. Assume that north is toward the top of the paper.

On your drawing, label each room and clearly show all doors.

2015 Spring Release, Technology/Engineering - High School
Question 4: Multiple-Choice

Reporting Category: Engineering Design
Standard: 1.4 - Interpret and apply scale and proportion to orthographic projections and pictorial drawings (e.g., 1/4" = 1'0", 1 cm = 1 m).

A building contractor is reviewing architectural plans for a new deck. The scale of the plan is . The width of the deck on the scaled drawing measures.

What length of decking material should be used to span the width of the deck with a single board while minimizing waste?

A. 6'

B. 10'

C. 12'

D. 16'

2015 Spring Release, Technology/Engineering - High School
Question 24: Multiple-Choice

Reporting Category: Construction and Manufacturing
Standard: 2.6 - Recognize the purpose of zoning laws and building codes in the design and use of structures.

Homeowners adding a new bathroom to their house are required by law to get a building permit before work is started. Which statement best describes the purpose of building permits for construction in existing homes?

A. Building permits provide homeowners with assistance in planning construction.

B. Building permits ensure that all construction work meets building codes for safety.

C. Building permits provide construction services to homeowners who are doing their own construction work.

D. Building permits ensure that the construction project will make the home more appealing to future homeowners.

2015 Spring Release, Technology/Engineering - High School
Question 43: Multiple-Choice

Reporting Category: Construction and Manufacturing
Standard: 2.4 - Calculate the resultant force(s) for a combination of live loads and dead loads.

The total load on a building floor is 60 lb. per sq. ft. The dead load is 40 lb. per sq. ft. What is the live load on the floor?

A. 20 lb. per sq. ft.
B. 40 lb. per sq. ft.
C. 60 lb. per sq. ft.
D. 100 lb. per sq. ft.

5b) If you seem to be on the right track, look for other words that have come up.

Keyword: Measurement

see 147 questions

some of the 39, above, are the same, but here is a sample of some others, much more from mathematics:

2016 Spring Release, Mathematics - Grade 3
Question 8: Multiple-Choice

Reporting Category: Measurement and Data
Standard: CCSS.Math.Content.3.MD.D.8 - Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Use your MCAS ruler to answer question 8.

A rectangle is shown below.

What is the perimeter, in centimeters, of the rectangle?

A. 8 centimeters

B. 10 centimeters

C. 15 centimeters

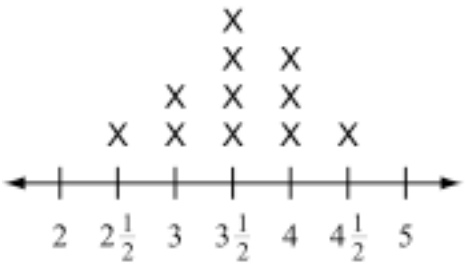
D. 16 centimeters

State Average = 80%

2016 Spring Release, Mathematics - Grade 3
Question 14: Multiple-Choice

Reporting Category: Measurement and Data
Standard: CCSS.Math.Content.3.MD.B.4 - Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

Each student in a third-grade class made a paper snowflake and measured its length. The line plot below shows the length, in inches, of each paper snowflake.



Length of Paper Snowflakes (in inches)

What is the length, in inches, of the longest paper snowflake?

A. 3 and 1/2

B. 4

C. 4 and 1/2

D. 5

State Average = 46%

2016 Spring Release, Mathematics - Grade 3
Question 17: Multiple-Choice

Show Questions

Reporting Category: Measurement and Data
Standard: CCSS.Math.Content.3.MD.B.3 - Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

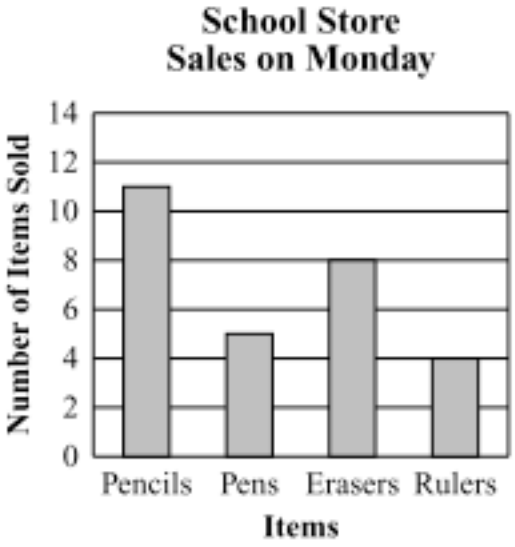
On Monday, the school store sold pencils, pens, erasers, and rulers.

- The store sold 6 more pencils than pens.
- The store sold 2 times as many erasers as rulers.

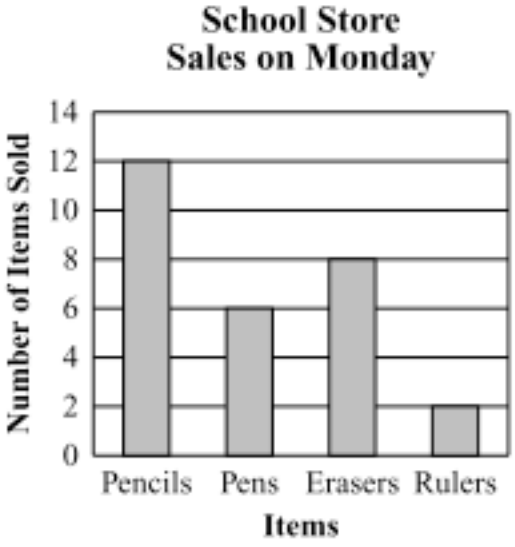
Which of these bar graphs could show the items that were sold on Monday

Sam Cota Worksheet 2.1: My Family Testing Advantages in re: Building, Measurement

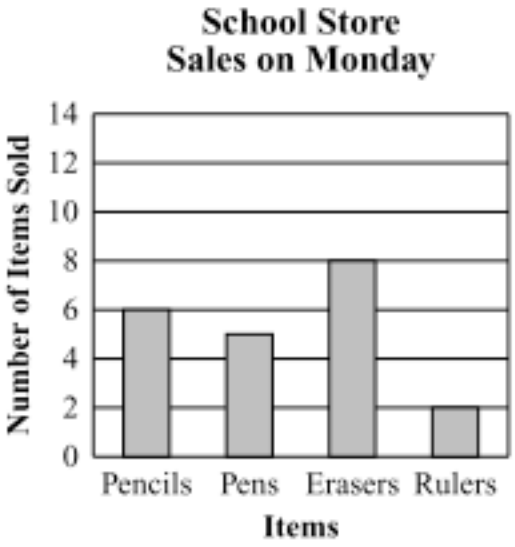
A.



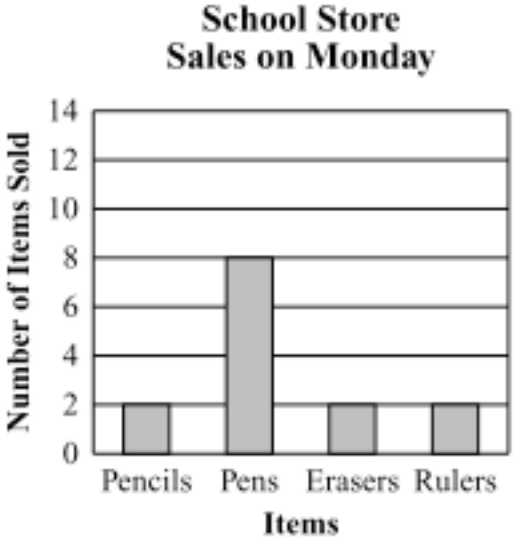
B.



C.



D.

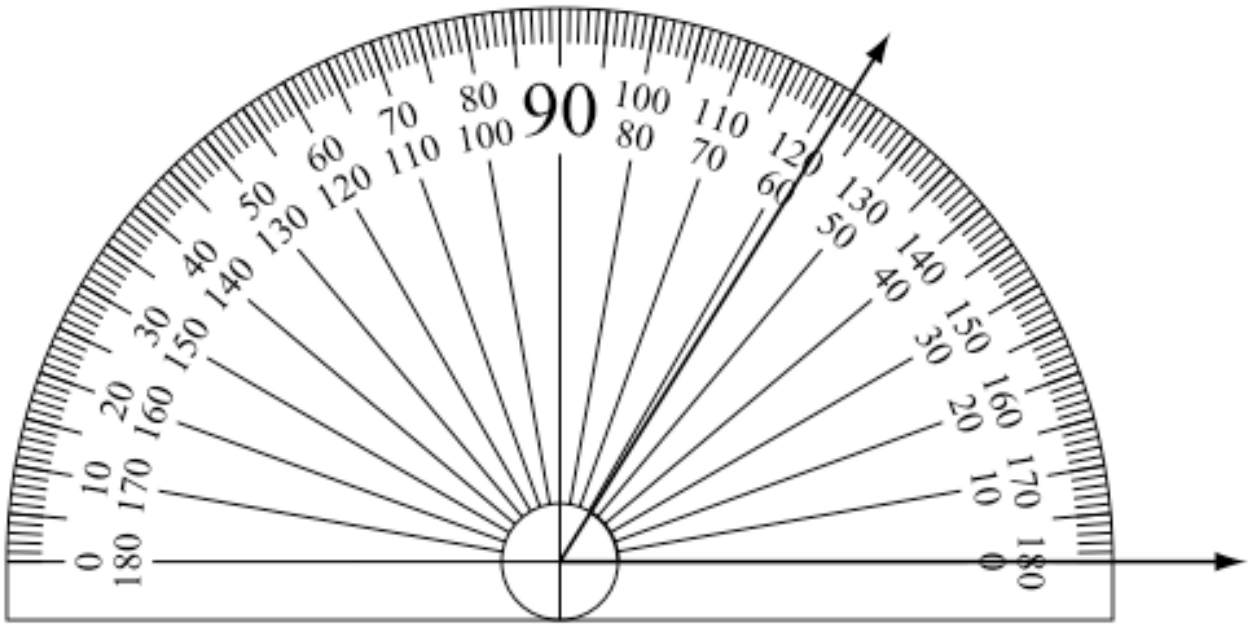


State Average = 64%

2014 Spring Release, Mathematics - Grade 4
Question 21: Multiple-Choice

Reporting Category: Measurement and Data
Standard: CCSS.Math.Content.4.MD.C.6 - Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

An angle and a protractor are shown below.



What is the measure of the angle?

A. 58°

B. 62°

C. 118°

D. 122°

State Average = 48%

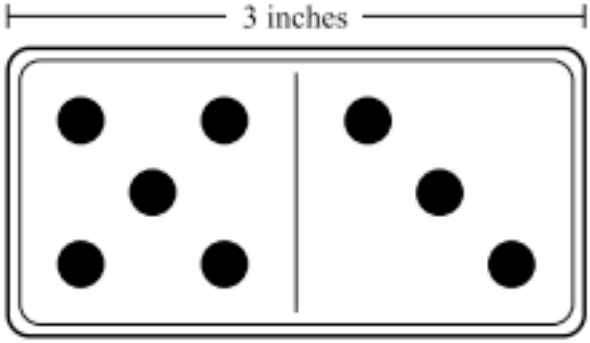
2013 Spring Release, Mathematics - Grade 4
Question 19: Short-Answer

Show Questions

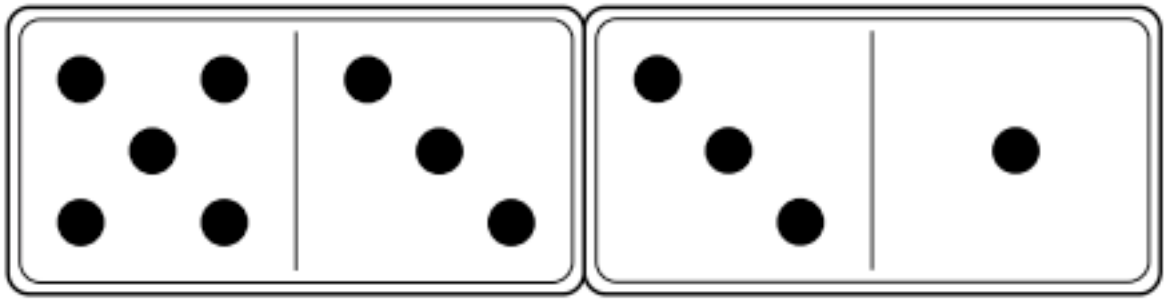
Reporting Category: Measurement and Data
Standard: 4.M.2 - Carry out simple unit conversions within a system of measurement, e.g., hours to minutes, cents to dollars, yards to feet or inches, etc.
Standard: CCSS.Math.Content.4.MD.A.2 - Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing

measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Renato has dominoes that are each 3 inches long, as shown below.



When he puts 2 dominoes end to end, they look like the picture below.



Renato puts 8 dominoes end to end. What is the total length, in feet, of Renato's 8 dominoes?

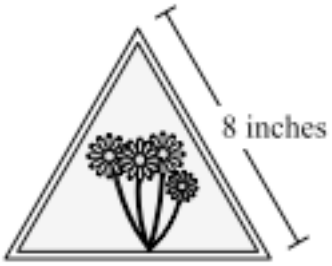
Answer: 2 feet

State Average = 48%

2011 Spring Release, Mathematics - Grade 5
Question 8: Open-Response

Reporting Category: Measurement
Standard: 5.M.1 - Apply the concepts of perimeter and area to the solution of problems involving triangles and rectangles. Apply formulas where appropriate.

Kiesha is decorating her bedroom. She wants to put ribbon around the picture shown below.



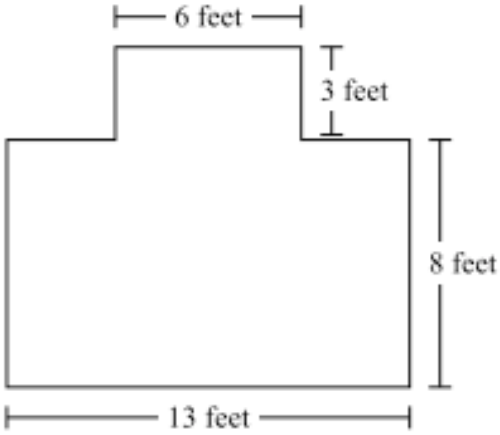
The picture is in the shape of an equilateral triangle.

1. What is the perimeter, in inches, of the picture? Show or explain how you got your answer.

Kiesha plans to cover one wall of her bedroom with wallpaper. The wall is in the shape of a rectangle. The dimensions of the wall are 13 feet by 9 feet.

1. What is the area, in square feet, of the wall? Show or explain how you got your answer.

Kiesha plans to carpet the floor of her bedroom. A diagram of the floor is shown below.



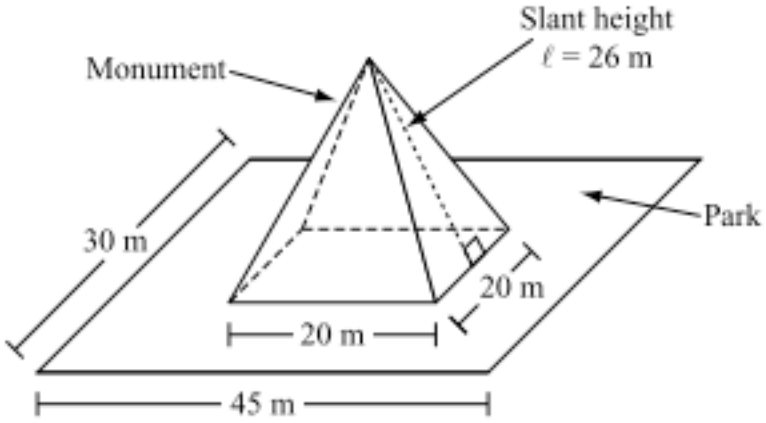
1. What is the area, in square feet, of the floor? Show or explain how you got your answer.

View Student Work

2012 Spring Release, Mathematics - Grade 10
Question 42: Open-Response

Reporting Category: Measurement
Standard: 10.M.2 - Given the formula, find the lateral area, surface area, and volume of prisms, pyramids, spheres, cylinders, and cones, e.g., find the volume of a sphere with a specified surface area.

A monument in the shape of a right square pyramid is located in a park. The park is in the shape of a rectangle. The measurements of the monument and the park are shown in the diagram below.



What is the area, in square meters, of the base of the monument? Show or explain how you got your answer.

What is the area, in square meters, of the park, not including the base of the monument? Show or explain how you got your answer.

What is the lateral surface area, in square meters, of the monument? Show or explain how you got your answer.

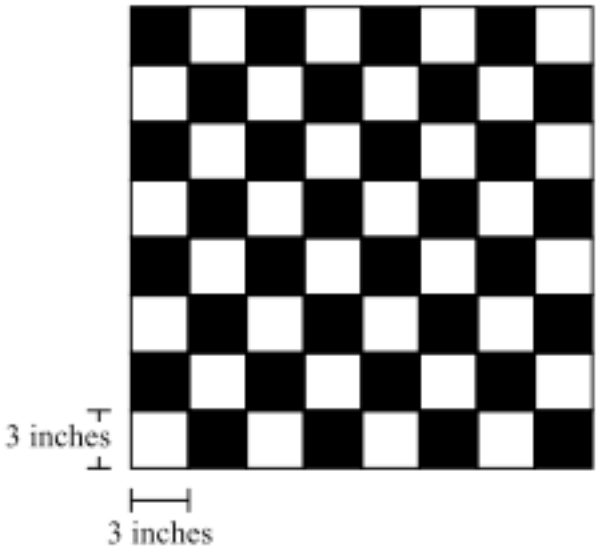
The height of the monument is 24 meters. What is the volume, in cubic meters, of the monument? Show or explain how you got your answer.

View Student Work

2012 Spring Release, Mathematics - Grade 5
Question 18: Multiple-Choice

Reporting Category: Measurement
Standard: 5.M.1 - Apply the concepts of perimeter and area to the solution of problems involving triangles and rectangles. Apply formulas where appropriate.

Edgar used congruent squares to make a checkerboard, as shown below.



The sides of each square have a length of 3 inches. What is the perimeter of Edgar's checkerboard?

A. 72 inches

B. 96 inches

C. 288 inches

D. 576 inches

State Average = 75%

2015 Spring Release, Mathematics - Grade 10
Question 37: Multiple-Choice

Reporting Category: Geometry
Standard: 10.M.1 - Calculate perimeter, circumference, and area of common geometric figures such as parallelograms, trapezoids, circles, and triangles.
Standard: CCSS.Math.Content.7.G.B.6 - Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

The diagram below shows a trapezoid and its measurements.

The trapezoid has an area of 60 square centimeters.

What is the value of x?

A. 10

B. 14

C. 16

D. 38

2015 Spring Release, Mathematics - Grade 5
Question 11: Multiple-Choice

Reporting Category: Measurement and Data
Standard: CCSS.Math.Content.5.MD.A.1 - Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Silvia filled a watering can with 3.48 liters of water. She used 40 milliliters to water her cactus plant and 150 milliliters to water her rose plant.
What is the total amount of water remaining in the watering can?

A. 158 milliliters

B. 329 milliliters

C. 1,580 milliliters

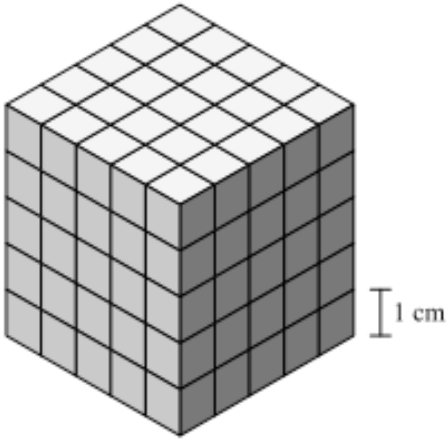
D. 3,290 milliliters

State Average = 33%

2015 Spring Release, Mathematics - Grade 5
Question 19: Short-Answer

Reporting Category: Measurement and Data
Standard: CCSS.Math.Content.5.MD.C.4 - Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

Tom used 1-centimeter blocks to build a cube, as shown below.
What is the volume, in cubic centimeters, of the cube Tom built?

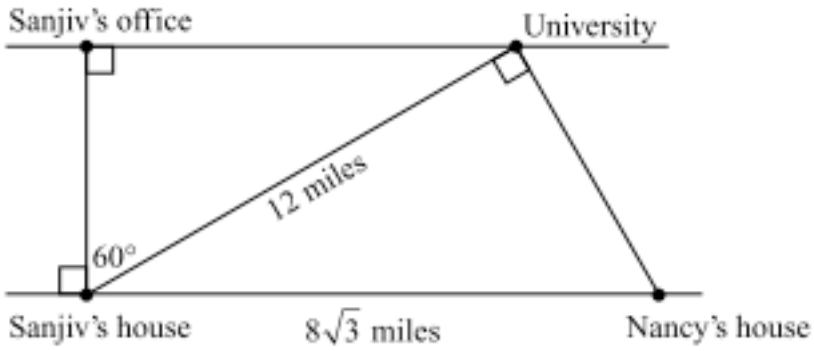


State Average = 69%

2014 November Retest, Mathematics - Grade 10
Question 42: Open-Response

Reporting Category: Geometry
Standard: 10.G.6 - Use the properties of special triangles (e.g., isosceles, equilateral, 30°-60°-90°, 45°-45°-90°) to solve problems.
Standard: CCSS.Math.Content.HSG-SRT.C.6 - Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

Sanjiv and Nancy are taking the same evening class at a university. The diagram below represents a street map showing the locations of their houses, the university, and Sanjiv's office.



In the morning, Sanjiv drives from his house to his office.
Based on the measurements in the diagram, what is the distance, in miles, from Sanjiv's house to his office? Show or explain how you got your answer.

In the evening, Sanjiv drives from his office to the university.
Based on the measurements in the diagram, what is the distance, to the nearest tenth of a mile, from Sanjiv's office to the university? Show or explain how you got your answer.

After class at the university, Sanjiv and Nancy each drive home along the shortest route shown in the diagram.

Based on the measurements in the diagram, what is the difference, to the nearest tenth of a mile, between the distance Sanjiv drives home and the distance Nancy drives home? Show or explain how you got your answer.

2016 Spring Release, Intro Physics - High School
Question 44: Open-Response

Reporting Category: Heat and Heat Transfer
Standard: 3.3 - Describe the relationship between average molecular kinetic energy and temperature. Recognize that energy is absorbed when a substance changes from a solid to a liquid to a gas, and that energy is released when a substance changes from a gas to a liquid to a solid. Explain the relationships between evaporation, condensation, cooling, and warming.

During cold periods, many orange growers repeatedly spray their trees with water to prevent the oranges from freezing. If the air is cold enough, the sprayed water freezes around the oranges, leaving the oranges themselves unfrozen.

Identify a measurement tool that orange growers use to measure the average kinetic energy of the air.

Describe what happens to the average molecular kinetic energy of the sprayed water as it cools before it freezes.

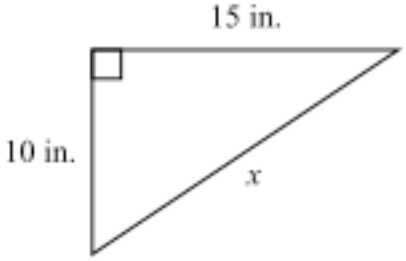
Describe what happens to the average molecular kinetic energy of the sprayed water as it freezes.

Explain how the phase change of the sprayed water may protect the oranges from freezing.

2016 Spring Release, Mathematics - Grade 8
Question 18: Short-Answer

Reporting Category: Geometry
Standard: CCSS.Math.Content.8.G.B.7 - Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

A right triangle and some of its measurements are shown below.



What is x, the length to the nearest inch of the third side of the triangle?

2016 Spring Release, Mathematics - Grade 5
Question 5: Short-Answer

Reporting Category: Measurement and Data
Standard: CCSS.Math.Content.5.MD.C.5 - Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume.

A box is in the shape of a right rectangular prism. The base of the box has an area of 15 square inches. The height of the box is 12 inches.What is the volume, in cubic inches, of the box?

Question 17: Open-Response

Reporting Category: Measurement and Data
Standard: CCSS.Math.Content.5.MD.A.1 - Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Yolanda took a bus to visit her grandmother for a four-day visit.

1. At the bus station she waited for 3/4ths of an hour until it was time to board the bus. How many minutes did Yolanda wait to board the bus? Show or explain how you got your answer.

Yolanda brought a CD to listen to on the bus.

- The CD is 78 minutes long.
- The bus ride was 2 and 1.2 hours long.

2. How many minutes longer was the bus ride than the CD? Show or explain how you got your answer.
3. Yolanda wondered how many minutes are in 4 days. What is the total number of minutes in 4 days? Show or explain how you got your answer.
4.

2016 Spring Release, Mathematics - Grade 5
Question 19: Multiple-Choice

Reporting Category: Measurement and Data
Standard: CCSS.Math.Content.5.MD.B.2 - Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*

Josh measured the daily rainfall in his city for two weeks. He recorded the rainfall amounts to the nearest one-fourth inch on a line plot, as shown below.

What is the total amount of rainfall Josh recorded for the two weeks?

A. 2 and 1/2 inches

B. 4 and 1/4 inches

C. 8 inches

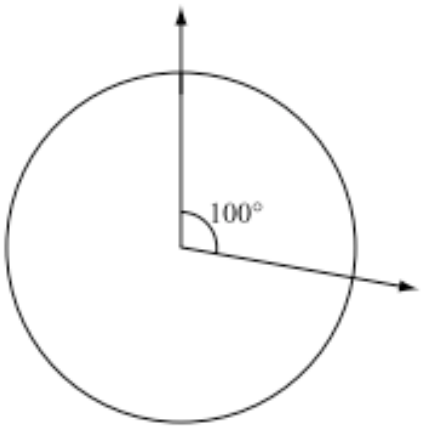
D. 14 inches

2016 Spring Release, Mathematics - Grade 4
Question 9: Multiple-Choice

Reporting Category: Measurement and Data

Standard: CCSS.Math.Content.4.MD.C.5 - Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:

Kendall drew a 100° angle from the center of a circle, as shown below.



What fraction of the circle does Kendall's angle turn through?

A. 100/360

B. 100/260

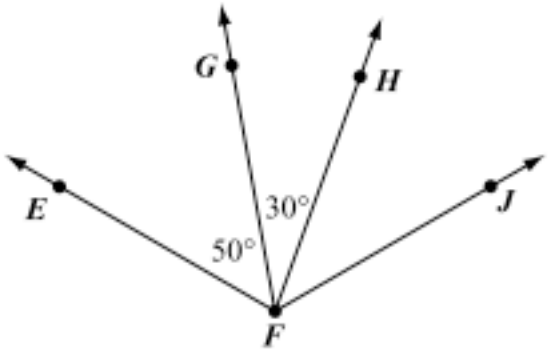
C. 100/180

D. 100/90

2016 Spring Release, Mathematics - Grade 4
Question 17: Short-Answer

Reporting Category: Measurement and Data
Standard: CCSS.Math.Content.4.MD.C.7 - Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

Some angles are shown in the diagram below.



Angle EFG has a measure of 50°, and angle GFH has a measure of 30°.

The sum of the measures of angles EFG, GFH, and HFJ is 120°.

What is the measure, in degrees, of angle HFJ?

And so on...