MASSACHUSETTS DEPARTMENT OF EDUCATION

MCAS

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COMPREHENSIVE
ASSESSMENT
SYSTEM

Release of March 2007 MCAS Retest Items

This document was prepared by the
Massachusetts Department of Education
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Commissioner's Foreword

Dear Colleagues:

One of the goals of the Department of Education is to help schools acquire the capacity to plan for and meet the accountability requirements of both state and federal law. In keeping with this goal, the Department regularly releases MCAS test items to provide information regarding the kinds of knowledge and skills that students are expected to demonstrate. In March 2007, MCAS retests in Mathematics and English Language Arts were administered in high schools across the state. In keeping with our past practice of releasing all test items on which student results are based, I am pleased to announce that all questions from these tests are included in *Release of March 2007 MCAS Retest Items*.

This publication is available only through the Department of Education Web site at www.doe.mass.edu/mcas/ testitems.html. The test items for both ELA and Mathematics can be easily printed from this site. I encourage local educators to use the relevant sections of this document together with their *Test Item Analysis Report Summaries* and *Test Item Analysis Rosters* as guides for planning changes in curriculum and instruction that may be needed to ensure that schools and districts make regular progress in improving student performance.

Thank you for your support as we work together to strengthen education for our students in Massachusetts.

Sincerely,

David P. Driscoll
Commissioner of Education

I. Document Purpose and Structure

Document Purpose and Structure

Purpose

The purpose of this document is to share with educators and the public all of the test items from the March 2007 MCAS English Language Arts and Mathematics Retests. Local educators will be able to use this information to identify strengths and weaknesses in their curriculum and instruction, and to guide the changes necessary to more effectively meet their students' needs.

This document is also intended to be used by school and district personnel as a companion document to the Test Item Analysis Reports. Each school in which a retest was administered receives a March Retest *Test Item Analysis Report Summary* and a *Test Item Analysis Roster* for English Language Arts and Mathematics. These reports provide data generated from student responses. Each report lists, for the school receiving the report, the names of all enrolled students who took the March 2007 Retest in that report's content area, and shows how each student answered each test question (item). The report labels each item as multiple-choice, open-response, short-answer, or writing prompt and identifies the item's MCAS reporting category. Item numbers in this document correlate directly to the "Item Numbers" in the Test Item Analysis Reports.

Structure

Chapters II and III of this document contain, respectively, information for the March 2007 English Language Arts and Mathematics Retests. Each of these chapters has three main sections. The first section introduces the chapter by listing the Massachusetts *Curriculum Framework* content strands assessed by MCAS in that chapter's content area. These content strands are identical to the MCAS reporting categories under which retest results are reported to schools and districts. In addition, there is a brief overview of the retest (number of test sessions, types of items, reference materials allowed, and cross-referencing information).

The **second section** contains the test items used to generate March 2007 MCAS student results for that chapter's content area. With the exception of the ELA Composition writing prompt, the test items in this document are shown in the same order and basic format in which they were presented in the test booklets. The Mathematics Reference Sheet used by students during MCAS Mathematics test sessions is inserted immediately following the last question in the Mathematics chapter.

Due to copyright restrictions, certain English Language Arts reading passages are not available on the Department's Internet site. Copyright information for all reading passages is provided in the document. For further information, contact Student Assessment Services at 781-338-3625.

The **final section** of each chapter is a table that cross-references each item with its MCAS reporting category and with the *Framework* standard it assesses. Correct answers to multiple-choice questions and, for the Mathematics retest, short-answer questions are also listed in the table.

Materials presented in this document are **not** formatted **exactly** as they appeared in student test booklets. For example, in order to present items most efficiently in this document, the following modifications have been made:

❚ Some fonts and/or font sizes may have been changed and/or reduced.

❚ Some graphics may have been reduced in size from their appearance in student test booklets; however, they maintain the same proportions in each case.

❚ All references to page numbers in answer booklets have been deleted from the directions that accompany test items.

❚ The four lined pages provided for students' initial English Language Arts Composition Retest drafts are omitted.

II. English Language Arts Retest

A. Composition
B. Reading Comprehension

English Language Arts Retest

Test Structure

The English Language Arts Retest was presented in the following two parts:

❚ the ELA Composition Retest, which used a writing prompt to assess learning standards from the Massachusetts *English Language Arts Curriculum Framework*'s **Composition** strand

❚ the ELA Reading Comprehension Retest, which used multiple-choice and open-response questions (items) to assess learning standards from the *Curriculum Framework*'s **Language** and **Reading and Literature** strands

A. Composition

The English Language Arts (ELA) Composition Retest was based on learning standards in the Composition strand of the Massachusetts *English Language Arts Curriculum Framework* (2001). These learning standards appear on pages 72–83 of the *Framework*, which is available on the Department Web site at www.doe.mass.edu/frameworks/current.html.

In Test Item Analysis Reports, ELA Composition Retest results are reported under the **Composition** reporting category.

Test Sessions and Content Overview

The ELA Composition Retest included two separate test sessions, administered on the same day with a short break between sessions. During the first session, each student wrote an initial draft of a composition in response to the appropriate writing prompt on the next page. During the second session, each student revised his or her draft and submitted a final composition, which was scored in the areas of Topic Development and Standard English Conventions. The MCAS Writing Scoring Guide (Composition Grade 10) is available at www.doe.mass.edu/mcas/student/scoring10.doc.

Reference Materials

At least one English-language dictionary per classroom was provided for student use during ELA Composition retest sessions. The use of bilingual word-to-word dictionaries was allowed for current and former limited English proficient students only. No other reference materials were allowed during either ELA Composition retest session.

Cross-Reference Information

Framework general standards 19–22 are assessed by the ELA Composition.

March Retest Writing Prompt

WRITING PROMPT

Works of literature often feature a character who learns or teaches something important.

From a work of literature you have read in or out of school, identify a character who learns or teaches something important. In a well-developed composition, describe what the character learns or teaches, and explain how that learning or teaching is important to the work of literature.

B. Reading Comprehension

The English Language Arts Reading Comprehension Retest was based on learning standards in the two content strands of the Massachusetts *English Language Arts Curriculum Framework* (2001) listed below. Page numbers for the learning standards appear in parentheses.

❚ Language (*Framework*, pages 19–26)

❚ Reading and Literature (*Framework*, pages 35–64)

The *English Language Arts Curriculum Framework* is available on the Department Web site at www.doe.mass.edu/frameworks/current.html.

In Test Item Analysis Reports, ELA Reading Comprehension retest results are reported under two MCAS reporting categories: **Language** and **Reading and Literature**, which are identical to the two *Framework* content strands listed above.

Test Sessions

The ELA Reading Comprehension Retest included three separate test sessions. Sessions 1 and 2 were both administered on the same day, and Session 3 was administered on the following day. Each session included selected readings, followed by multiple-choice and open-response questions. Reading passages and test items are shown on the following pages as they appeared in test booklets. Due to copyright restrictions, certain passages cannot be released to the public on the Web site.

Reference Materials

The use of bilingual word-to-word dictionaries was allowed for limited English proficient students only, during all three ELA Reading Comprehension sessions. No other reference materials were allowed during any ELA Reading Comprehension retest session.

Cross-Reference Information

The table at the conclusion of this chapter indicates each item's reporting category and the *Framework* general standard it assesses. The correct answers for multiple-choice questions are also displayed in the table.

DIRECTIONS
This session contains two reading selections with twelve multiple-choice questions and two open-response questions. Mark your answers to these questions in the spaces provided in your Student Answer Booklet.

A scholar/athlete, professional basketball player, and politician, Bill Bradley writes about values, life lessons, and professional basketball in his book Values of the Game. *Read this excerpt about his "passion" and answer the questions that follow.*

PASSION

by Bill Bradley

Students read an excerpt from PASSION and then answered questions 1 through 8 that follow on pages 10–12 of this document.

Due to copyright restrictions, the selection cannot be released to the public over the Internet. For more information, see the copyright citation below.

1 According to the excerpt, what **most** motivated Bradley?

   A. his commitment to his school

   B. his desire to improve his skills

   C. his dedication to his teammates

   D. his dream to become a celebrity

2 In paragraph 2, what is emphasized by Bradley's references to his shirt?

   A. his skill

   B. his hygiene

   C. his persistence

   D. his carelessness

3 Read the sentences from the excerpt in the box below.

> The seams and the grain of the leather ball had to feel a certain way. My fingertips went right to the grooves and told me if it felt right. (paragraph 2)
>
> The floor was polished and shining; when I moved, it glistened as if I were playing on a mirror. (paragraph 3)

What do the details of the sentences **mostly** suggest about Bradley?

   A. He preferred a clean environment.

   B. He grew tired of his repetitive routine.

   C. He was distracted by the gym's condition.

   D. His senses were heightened as he practiced.

4 According to the excerpt, on the morning after his team loses a game to its arch rival, Bradley returns to the gym because

A. he wants to escape his critics.

B. he feels responsible for the loss.

C. he feels most comfortable there.

D. he wants to practice a new shot.

5 Which of the following sentences from the excerpt **best** emphasizes Bradley's instinctive connection to basketball?

A. "My fingertips went right to the grooves and told me if it felt right."

B. "The gymnasium itself was a part of my solitary joy."

C. "If I hit ten in a row, I wanted fifteen."

D. "In my dream, of course, I'd hit it and we'd be state champions."

6 What is the meaning of the phrase "conjured up" as it is used in paragraph 6?

A. watched

B. imagined

C. prepared for

D. worried about

7 Read the sentences from the excerpt in the box below.

> Then you start shooting: legs bent, eyes on the rim, elbow under the ball.
>
> I persevered through blisters, contusions, and strained joints.
>
> "Five seconds left, four seconds, three, Bradley dribbles right in heavy traffic, jumps, shoots—good at the buzzer!"

What is the function of the commas as they are used in each of the sentences?

A. to separate items in a series

B. to set off an introductory phrase

C. to set off parenthetical elements

D. to separate two independent clauses

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Question 8 is an open-response question.

- **Read the question carefully.**
- **Explain your answer.**
- **Add supporting details.**
- **Double-check your work.**

Write your answer to question 8 in the space provided in your Student Answer Booklet.

8   Explain why "Passion" is an appropriate title for the excerpt. Support your answer with relevant and specific details from the excerpt.

Francie Nolan is fifteen years old and has a job clipping articles from newspapers. In the following excerpt, the first paper to reach Francie's desk one morning announces the outbreak of World War I. Read the excerpt and answer the questions that follow.

from A Tree Grows in Brooklyn

by Betty Smith

1 A NEWSPAPER LAY ON FRANCIE'S DESK. IT WAS AN "EXTRA"[1] AND HAD come directly from the presses. The ink was still damp on its headline. The paper had been there five minutes and as yet she had not picked up her pencil to mark it. She stared at the date.

2 April 6, 1917.

3 The one-word headline was six inches high. The three letters were smudged at the edges and the word, WAR, seemed to waver.

4 Francie had a vision. Fifty years from now, she'd be telling her grandchildren how she had come to the office, sat at her reader's desk and in the routine of work had read that war had been declared. She knew from listening to her grandmother that old age was made up of such remembrances of youth.

5 But she didn't want to recall things. She wanted to live things—or as a compromise, re-live rather than reminisce.

6 She decided to fix this time in her life exactly the way it was this instant. Perhaps that way she could hold on to it as a living thing and not have it become something called a memory.

7 She brought her eyes close to the surface of her desk and examined the patterned grain of the wood. She ran her fingers along the groove where her pencils rested, fixing the feel of the groove in her mind. Using a razor blade, she nicked the next dot on one of her pencils and unraveled the paper. She held the raveling in her palm, touched it with her forefinger, and noted its spiraling. She dropped it into the metal wastebasket counting the seconds it took to fall. She listened intently so as not to miss its almost noiseless thud as it hit the bottom. She pressed her fingertips to the damp headline, examined her inked fingertips, then made fingerprints on a sheet of white paper.

8 Not caring about clients who might be mentioned on pages one and two, she detached the front sheet of the newspaper and folded the sheet into a careful oblong, watching the creases come under her thumb. She inserted it into one of the strong manila envelopes that the Bureau used to mail clippings in.

9 Francie heard, as if for the first time, the sound the desk drawer made when she opened it to get her purse. She noted the device of the purse's catch—the sound of its click. She felt the leather, memorized its smell and studied the whorlings[2] of the black moiré-silk[3] lining. She read the dates on the coins in her change purse. There was a new 1917 penny which she put

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[1] *extra* — a special edition of a newspaper
[2] *whorlings* — swirls
[3] *moiré silk* — a fabric with a wavy or rippled surface pattern

in the envelope. She uncapped her lipstick and made a line with it under her fingerprints. The clear red color, the texture and the scent of it pleased her. She examined in turn the powder in her compact, the ridges on her nail file, the way her comb was inflexible and the threads of her handkerchief. There was a worn clipping in the purse, a poem she had torn out of an Oklahoma newspaper. It had been written by a poet who had lived in Brooklyn, gone to the Brooklyn public schools and, as a young man, had edited *The Brooklyn Eagle*. She reread it for the twentieth time handling each word in her mind.

> *I am of old and young, of the foolish as much as the wise;*
> *Regardless of others, ever regardful of others.*
> *Maternal as well as paternal, a child as well as a man,*
> *Stuff'd with the stuff that is coarse, and stuff'd*
>   *with the stuff that is fine.*

10 The tattered poem went into the envelope. In the mirror of her compact, she looked at the way her hair was braided—how the braids wound around her head. She noticed how her straight black eyelashes were uneven in length. Then her shoes were inspected. She ran her hand down her stockings and for the first time noticed that the silk felt rough instead of smooth. The fabric of her dress was made of tiny cords. She turned back the hem and noticed that the narrow lace edge of her slip was diamond-shaped in design.

11 "If I can fix every detail of this time in my mind, I can keep this moment always," she thought.

12 Using the razor blade, she clipped a lock of her hair, wrapped it in the square of paper on which were her fingerprints and lipstick mark, folded it, placed it in the envelope and sealed the envelope. On the outside she wrote:

13 Frances Nolan, age 15 years and 4 months. April 6, 1917.

14 She thought: "If I open this envelope fifty years from now, I will be again as I am now and there will be no being old for me. There's a long, long time yet before fifty years . . . millions of hours of time. But one hour has gone already since I sat here . . . one hour less to live . . . one hour gone away from all the hours of my life.

15 "Dear God," she prayed, "let me be *something* every minute of every hour of my life. Let me be gay; let me be sad. Let me be cold; let me be warm. Let me be hungry . . . have too much to eat. Let me be ragged or well dressed. Let me be sincere—be deceitful. Let me be truthful; let me be a liar. Let me be honorable and let me sin. Only let me be *something* every blessed minute. And when I sleep, let me dream all the time so that not one little piece of living is ever lost."

16 The delivery boy came by and slapped another city paper on her desk. This one had a two-word headline.

17 WAR DECLARED!

9 According to paragraph 5, why is Francie unwilling to "recall things"?

A. She prefers to keep the present alive.

B. She refuses to dwell on her mistakes.

C. She resolves to focus on her ambitions.

D. She wants to forget unhappy memories.

10 Read the sentence from paragraph 9 in the box below.

> Francie heard, as if for the first time, the sound the desk drawer made when she opened it to get her purse.

What does the phrase "as if for the first time" **most likely** suggest?

A. Francie has never had a reason to open the drawer before.

B. Francie has never consciously listened to the sound before.

C. The drawer has been silent when it has been opened in the past.

D. The drawer has made a different sound from the one it made in the past.

11 What do the contrasting pairs in paragraph 15 show about Francie?

A. She feels confused about her future.

B. She wants to be fully engaged in life.

C. She has misinterpreted the newspaper article.

D. She is excited about how the world is changing.

12 Which phrase **best** expresses the meaning of the word *reminisce* as it is used in paragraph 5?

A. think about past experiences

B. strive for youthful ambitions

C. forget about childhood amusements

D. advance beyond old behavior patterns

13 By writing the word *something* in italics and repeating it in paragraph 15, what does the author emphasize?

A. Francie's fear of being forgotten by other people

B. Francie's desire to fill her life with vital moments

C. Francie's indifference about the outcome of the war

D. Francie's understanding that life involves difficulties

Question 14 is an open-response question.

- **Read the question carefully.**
- **Explain your answer.**
- **Add supporting details.**
- **Double-check your work.**

Write your answer to question 14 in the space provided in your Student Answer Booklet.

14 Based on the excerpt, explain the significance of the items Francie includes in her envelope. Support your answer with relevant and specific details from the excerpt.

DIRECTIONS
This session contains two reading selections with twelve multiple-choice questions and one open-response question. Mark your answers to these questions in the spaces provided in your Student Answer Booklet.

In Afghanistan in the 1970s, a boy named Amir, who is from a wealthy family, has grown up playing with Hassan, the uneducated son of a family servant. Both boys follow the traditional Afghan sport of kite fighting, in which players fly kites with glass-coated strings and try to cut the kite strings of other players. Read the excerpt from the novel The Kite Runner *and answer the questions that follow.*

from The Kite Runner
by Khaled Hosseini

Students read an excerpt from THE KITE RUNNER and then answered questions 15 through 23 that follow on pages 19–21 of this document.

Due to copyright restrictions, the selection cannot be released to the public over the Internet. For more information, see the copyright citation below.

15 According to the excerpt, what is the goal of the kite-fighting tournament?

  A. to keep one's kite in the air for the longest time

  B. to fly one's kite at the highest altitude

  C. to perform the best stunts with one's kite

  D. to run the farthest distance with one's kite

16 According to the excerpt, who are the "kite runners"?

  A. children who compete to catch falling kites

  B. players who guide kites to a distant finish line

  C. assistants who launch the players' largest kites

  D. spectators who return the players' runaway kites

17 Beginning in paragraph 7, the narrator's focus changes from describing the customs around kite-fighting tournaments to

  A. recounting a particular event.

  B. criticizing the behavior of fans.

  C. analyzing a technique of kite fighting.

  D. contrasting different styles of kite fighting.

18 Which statement **best** describes Hassan as he waits for the kite to fall?

  A. He hopes that he is correct.

  B. He feels hungry and thirsty.

  C. He worries about the narrator.

  D. He feels relaxed and confident.

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19 In paragraphs 17–20, what do Hassan's indirect responses to the narrator **most likely** suggest?

A. that Hassan is afraid to admit his ignorance

B. that Hassan is unwilling to share his method

C. that Hassan thinks guessing succeeds as often as calculating

D. that Hassan thinks trusting is more important than understanding

20 In paragraph 27, what is the narrator suggesting about "people like Hassan"?

A. They project an anger the narrator fears.

B. They show an honesty the narrator lacks.

C. They reveal a pain the narrator has not felt.

D. They offer a kindness the narrator cannot return.

21 In paragraph 29, when the narrator says "I forced a smile," he is **most likely** feeling

A. angry.

B. surprised.

C. disappointed.

D. uncomfortable.

22 Which of the following is **closest** in meaning to the word *coveted* as it is used in paragraph 5?

A. desirable

B. profitable

C. expensive

D. necessary

Question 23 is an open-response question.

- **Read the question carefully.**
- **Explain your answer.**
- **Add supporting details.**
- **Double-check your work.**

Write your answer to question 23 in the space provided in your Student Answer Booklet.

23   Based on the excerpt, explain the differences between the narrator and Hassan. Support your answer with relevant and specific details from the excerpt.

Thor, the mythical Norse god of thunder, was regarded by the people of medieval Scandinavia as a protector of humans against the forces of evil. Read the following poem and answer the questions that follow.

The Challenge of Thor
from "The Saga of King Olaf "

I am the God Thor,
I am the War God,
I am the Thunderer!
Here in my Northland,
5 My fastness and fortress,
Reign I forever!

Here amid icebergs
Rule I the nations;
This is my hammer,[1]
10 Miölner the mighty;
Giants and sorcerers
Cannot withstand it!

These are the gauntlets[2]
Wherewith I wield it,
15 And hurl it afar off;
This is my girdle;[3]
Whenever I brace it,
Strength is redoubled!

The light thou beholdest
20 Stream through the heavens,
In flashes of crimson,
Is but my red beard
Blown by the night-wind,
Affrighting the nations!

25 Jove is my brother;
Mine eyes are the lightning;
The wheels of my chariot
Roll in the thunder,
The blows of my hammer
30 Ring in the earthquake!

Force rules the world still,
Has ruled it, shall rule it;
Meekness is weakness,
Strength is triumphant,
35 Over the whole earth
Still is it Thor's-Day!

Thou art a God too,
O Galilean!
And thus single-handed
40 Unto the combat,
Gauntlet or Gospel,
Here I defy thee!

—Henry Wadsworth Longfellow

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[1] *hammer* — an instrument of power
[2] *gauntlets* — protective gloves worn with medieval armor
[3] *girdle* — a belt or sash worn around the waist

24 Which of the following statements expresses the **main** idea of the poem?

    A. Power and might are Thor's weapons.

    B. Other gods and rulers fear Thor's anger.

    C. Giants and sorcerers are at Thor's mercy.

    D. Thunderstorms demonstrate Thor's power.

25 Which pair of lines from the poem **most clearly** shows Thor's command of the powers of nature?

    A. "My fastness and fortress, / Reign I forever!"

    B. "This is my hammer, / Miölner the mighty;"

    C. "The wheels of my chariot / Roll in the thunder,"

    D. "Meekness is weakness, / Strength is triumphant,"

26 Which of the following words **best** describes the speaker's tone in the poem?

    A. bold

    B. calm

    C. resentful

    D. desperate

27 What does the poet's use of an exclamation point at the end of each stanza **mostly** indicate?

    A. that Thor's claims are exaggerated

    B. that Thor speaks with great difficulty

    C. that Thor's exact words are presented

    D. that Thor speaks with emotional force

DIRECTIONS
This session contains two reading selections with twelve multiple-choice questions and one open-response question. Mark your answers to these questions in the spaces provided in your Student Answer Booklet.

A native of Boston, Massachusetts, Dr. Howard Bluestein is one of the country's top tornado researchers. For over 25 years, he has been taking risks to chase storms so that he can better understand and learn from them. Read the interview with Dr. Bluestein from ODYSSEY *magazine. Use the information in the interview to answer the questions that follow.*

Chasing Tornadoes:
An Interview with Howard Bluestein
by Steven R. Wills

1   Lots of people chase tornadoes, usually for the thrill. But Howard Bluestein is "the tornado chaser." He has spent 25 years getting up-close-and-personal with twisters, not for excitement, but in an attempt to learn more about them. His fascination with these violent weather events has brought him to the attention of meteorological researchers and even Hollywood producers. (The film *Twister* was based in part on Bluestein's research, although he doesn't think that the movie was a very accurate portrayal.) He is a Samuel Roberts Noble Presidential Professor of Meteorology at the University of Oklahoma, and recently authored the popular book *Tornado Alley: Monster Storms of the Great Plains.* He talked with *ODYSSEY* from his summer research position at the National Center for Atmospheric Research (NCAR) in Boulder, CO.

2   **Each spring you gather your crew for the tornado season. Why is spring the best time for tornado formation?**

3   It's the best time in the Plains area of the United States. During spring you get a return of moisture from the Gulf of Mexico to the south, and moderately strong winds from the west with the jet stream.[1] So, at that time of year, disturbances move from west to east and all the factors come together: moisture from the Gulf of Mexico, warm surface temperature that decreases rapidly with height, a strong change of direction and wind speed with height, and a jet stream far enough south that you can get the strong vertical wind shear[2] that you need to make *supercells*—huge rotating storm clouds.

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[1] *jet stream* — a high-speed wind, generally moving from a westerly direction at speeds often exceeding 250 miles an hour

[2] *vertical wind shear* — a change of wind speed or direction with altitude

4 **What conditions indicate that there's a good chance of tornadoes on any given day?**

5   First, I look to see if there's enough Gulf moisture. If there isn't enough moisture, then forget it. Then I look to see whether the temperature decreases with height relatively rapidly—and whether there is a high enough surface temperature so that a parcel of air can go up very, very high into the atmosphere. That tells me that thunderstorms are possible. Then I look at the vertical wind shear—whether the winds will be changing direction or speed enough for a supercell thunderstorm. Those conditions are necessary for a tornado, but they aren't enough. Finally, I look for some triggering mechanism—an upper-level disturbance that will enhance the probability that storms will form.

6 **What is a typical storm chase like?**

7   We look at the weather in the morning—surface observations, satellite observations, computer forecasts, radar—and I decide whether there's a significant chance of tornadoes somewhere in an area that we can get to, which means roughly within 200 to 250 miles. We try to choose a target area and go. We may stop, plug the laptop in and get computer data from back home, or I might get on the cell phone. We get information any way we can—and we also depend on our visual observations and past experience. If more than one storm comes up, we decide which is the more likely to produce a tornado. We have two mobile radars, so we can see if a storm has rotation, and we can see where it might be going and we can try to get in its path—not directly, but within one or two miles.

8   But typically, we don't see anything. Tornadoes don't last long and their paths change, and the road system doesn't always allow you to get exactly where you need to go.

9 ***ODYSSEY* readers would love to hear about one of the most dramatic moments you've had as a storm chaser . . .**

10   Oh, there have been many of them— seeing my first F5 tornado in 1991 was one. We were up in north-central Oklahoma and we heard reports of a tornado to our south. There was rain and hail between us and the tornado, as we moved east and then south. We could see the tornado—it was getting larger and larger because we were getting closer and closer. We were right in its path. We set up right in front of the tornado. . . my students told me that it was coming right at us. We dropped south, and they took measurements and I just watched in awe as the tornado churned and crossed the road just to our north. It destroyed a house and then the wind shifted to the southwest. We were in the downdraft[3] and it started raining heavily and the tornado disappeared into the rain. We were just about a mile from where telephone poles were lying in the road. I remember thinking as I watched it, "This is something I'm not going to see very often in my life."

11 **Based on the many amateur videos we see of tornadoes, the general public also**

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[3] *downdraft* — downward moving air in a thunderstorm

seems to be fascinated with seeing and photographing twisters in action. Are you concerned for their safety?

12   I would say so. People think that it's easy to go out and take video and that they're always going to be safe, but that's not the case. If they are less than two miles from a tornado they could be injured, even if they are not in the direct path. The greatest risk is getting hit by flying debris.

13   **Do you see any increase in violent weather patterns?**

14   Absolutely not! I've been doing this for 25 years, and I can think of times when all hell breaks loose and then there are years when very little happens. The spring of 2003 happened to have been a time with a lot of activity—an unusually large amount of activity—but the year before was relatively quiet. You'd have to go back to 1999 before I could say that it was a relatively active year. Before that, I'd have to go back to 1995, then 1991. I think it's normal fluctuation.

15   **What do you see as the ultimate goal of tornado research?**

16   We don't yet understand why it is that some supercells produce tornadoes and some do not. We need to understand this if we are ever going to be able to make a forecast that says, "This thunderstorm here—don't worry about it. However, this thunderstorm over here is more of an issue and you had better seek shelter." That's the ultimate goal, and to do that you need to understand how the tornado forms. Right now, the National Weather Service looks for evidence of rotation in a storm. If they see the rotation, they go ahead and put out a tornado warning. We now know that the number of such storms that actually produce tornadoes is only 5 to 10 percent. So you issue a lot of false warnings, and if you cry "Wolf!" too often, the public may not get excited about future warnings.

17   **You say in your book, "In order to study a meteorological phenomenon properly, you must actually experience and appreciate it aesthetically." Those words usually are used when discussing a form of art.**

18   Nature is an art show. Watching the weather is watching theater. I enjoy what I do. I see things each year that I've never seen before, and I'm still fascinated. I'm the sort of person who says, "Look, tornadoes might be an interesting scientific problem, but I'm not going to study a tornado by looking at someone else's data or by making a computer simulation[4] without ever having actually seen one. I want to see the tornado itself."

. . .

---

[4] *simulation* — reproduction of exact conditions

28 According to paragraph 1, what is Bluestein's motivation for chasing tornadoes?

A. fame

B. money

C. education

D. adventure

30 Based on Bluestein's response in paragraph 10, an F5 tornado is **most likely** one that is

A. most severe.

B. most controversial.

C. frequently observed.

D. usually inescapable.

29 According to paragraph 3, what conditions make spring an ideal season for tornado formation in the Plains area?

A. the rotation of wind and sea currents

B. the movement and height of thunderclouds

C. the merging of warm moisture and strong winds

D. the interaction of wind disturbances from the north and south

31 According to paragraph 12, amateur storm chasers should be **most** concerned about which of the following?

A. missing a rare opportunity

B. crossing the path of a twister

C. becoming lost in a secondary storm

D. suffering injury from airborne objects

32 According to paragraph 16, what is the **most** important goal of tornado forecasting?

   A. to support future storm research

   B. to provide reliable information to people

   C. to predict the best times for tracking tornadoes

   D. to give people an understanding of tornado formation

33 Read the sentence from paragraph 16 in the box below.

> So you issue a lot of false warnings, and if you cry "Wolf!" too often, the public may not get excited about future warnings.

What does the sentence suggest about Bluestein's fears about tornado warnings?

   A. People will become angry at weather forecasters who mislead them.

   B. People will ignore forecasts if inaccurate information is given frequently.

   C. People will miss the beauty of tornadoes if they are frightened by warnings.

   D. People will be less interested in his work if they hear about too many routine events.

34 What is the effect of the use of an interview format for this article?

   A. It makes the subject of tornadoes seem less controversial.

   B. It allows Bluestein to communicate directly to the reader.

   C. It emphasizes the scientific approach to chasing tornadoes.

   D. It gives the reader a summary of Bluestein's achievements.

35 Read the sentence from paragraph 7 in the box below.

> We look at the weather in the morning—surface observations, satellite observations, computer forecasts, radar—and I decide whether there's a significant chance of tornadoes somewhere in an area that we can get to, which means roughly within 200 to 250 miles.

What is the purpose of the dashes?

   A. to introduce contrasting ideas

   B. to show the speaker's hesitation

   C. to set off clarifying information

   D. to emphasize the speaker's emotions

Question 36 is an open-response question.

- **Read the question carefully.**
- **Explain your answer.**
- **Add supporting details.**
- **Double-check your work.**

Write your answer to question 36 in the space provided in your Student Answer Booklet.

36 Based on the interview, explain the frustrations and rewards Bluestein has experienced as a tornado chaser. Support your answer with relevant and specific details from the interview.

In this excerpt from her book Living Out Loud, *Anna Quindlen writes about her changing neighborhood. Read to find out why she titled the essay "Melting Pot." Answer the questions that follow.*

MELTING POT

by ANNA QUINDLEN

1   My first apartment in New York was in a gritty warehouse district, the kind of place that makes your parents wince. A lot of old Italians lived around me, which suited me just fine because I was the granddaughter of old Italians. Their own children and grandchildren had moved to Long Island and New Jersey. All they had was me. All I had was them.

2   I remember sitting on a corner with a group of half a dozen elderly men, men who had known one another since they were boys sitting together on this same corner, watching a glazier install a great spread of tiny glass panes to make one wall of a restaurant in the ground floor of an old building across the street. The men laid bets on how long the panes, and the restaurant, would last. Two years later two of the men were dead, one had moved in with his married daughter in the suburbs, and the three remaining sat and watched dolefully as people waited each night for a table in the restaurant. "Twenty-two dollars for a piece of veal!" one of them would say, apropos of[1] nothing. But when I ate in the restaurant they never blamed me. "You're not one of them," one of the men explained. "You're one of me." It's an argument familiar to members of almost any embattled race or class: I like you, therefore you aren't like the rest of your kind, whom I hate.

3   Change comes hard in America, but it comes constantly. The butcher whose old shop is now an antiques store sits day after day outside the pizzeria here like a lost child. The old people across the street cluster together and discuss what kind of money they might be offered if the person who bought their building wants to turn it into condominiums. The greengrocer stocks yellow peppers and fresh rosemary for the gourmands, plum tomatoes and broad-leaf parsley for the older Italians, mangoes for the Indians. He doesn't carry plantains, he says, because you can buy them in the bodega.[2]

4   Sometimes the baby slips out with the bath water. I wanted to throw confetti the day that a family of rough types who propped their speakers on their station wagon and played heavy metal music at 3:00 A.M. moved out. I stood and smiled as the seedy bar at the corner was transformed into a slick Mexican restaurant. But I liked some of the people who moved out at the same time the rough types did. And I'm not sure I have that much in common with the singles who have made the restaurant their second home.

---

[1] *apropos of* — relevant to
[2] *bodega* — grocery store

5   Yet somehow now we seem to have reached a nice mix. About a third of the people in the neighborhood think of squid as calamari, about a third think of it as sushi, and about a third think of it as bait. Lots of the single people who have moved in during the last year or two are easygoing and good-tempered about all the kids. The old Italians have become philosophical about the new Hispanics, although they still think more of them should know English. The firebrand community organizer with the storefront on the block, the one who is always talking about people like us as though we stole our houses out of the open purse of a ninety-year-old blind widow, is pleasant to my boys.

6   Drawn in broad strokes, we live in a pressure cooker: oil and water,[3] us and them. But if you come around at exactly the right time, you'll find members of all these groups gathered around complaining about the condition of the streets, on which everyone can agree. We melt together, then draw apart. I am the granddaughter of immigrants, a young professional—either an interloper or a longtime resident, depending on your concept of time. I am one of them, and one of us.

_____

[3] *oil and water* — oil and water can be mixed or shaken together, but will separate when left alone

---

37 Why is "Melting Pot" an appropriate title for this essay?

A. Foods of all kinds are cooked in the local restaurants.

B. People from many backgrounds live in the area.

C. The hot weather in the summer forces everyone outside.

D. Violence is simmering beneath the surface of the community.

38 In paragraph 2, what does the old man's comment about the price of a meal suggest to the reader?

A. He feels the neighborhood has become a more diverse place.

B. He feels his favorite places to eat are going out of business.

C. He feels the neighborhood is changing for the worse.

D. He feels the restaurants are serving bad food.

39 In paragraph 2, what does the elderly man mean when he tells the narrator, "You're not one of them. . . . You're one of me"?

A. He sees that the narrator is beginning to look old.

B. He feels the narrator is like him and not like the new people.

C. He wants to encourage the narrator to feel proud of her heritage.

D. He hopes the narrator will not be ashamed of eating in the expensive restaurant.

40 Based on the essay, how does the narrator feel about her neighborhood?

A. She fears the old homes and apartment buildings will be torn down.

B. She enjoys its diversity and the fact that it is always changing.

C. She likes to visit the new restaurants and shops.

D. She worries that it is a bad influence on her sons.

English Language Arts
Reading Comprehension Retest
March 2007 Released Items:
Reporting Categories, Standards, and Correct Answers*

Item No.	Page No.	Reporting Category	Standard	Correct Answer (MC)*
1	10	*Reading and Literature*	13	B
2	10	*Reading and Literature*	8	C
3	10	*Reading and Literature*	15	D
4	11	*Reading and Literature*	8	C
5	11	*Reading and Literature*	8	A
6	11	*Language*	4	B
7	11	*Language*	5	A
8	12	*Reading and Literature*	13	
9	15	*Reading and Literature*	8	A
10	15	*Reading and Literature*	15	B
11	15	*Reading and Literature*	15	B
12	15	*Language*	4	A
13	15	*Reading and Literature*	15	B
14	16	*Reading and Literature*	12	
15	19	*Reading and Literature*	8	A
16	19	*Reading and Literature*	8	A
17	19	*Reading and Literature*	15	A
18	19	*Reading and Literature*	12	D
19	20	*Reading and Literature*	12	D
20	20	*Reading and Literature*	12	B
21	20	*Reading and Literature*	12	D
22	20	*Language*	4	A
23	21	*Reading and Literature*	12	
24	23	*Reading and Literature*	8	A
25	23	*Reading and Literature*	14	C
26	23	*Reading and Literature*	15	A
27	23	*Langauge*	5	D
28	27	*Reading and Literature*	8	C
29	27	*Reading and Literature*	13	C
30	27	*Reading and Literature*	13	A
31	27	*Reading and Literature*	8	D
32	28	*Reading and Literature*	13	B
33	28	*Reading and Literature*	8	B
34	28	*Reading and Literature*	10	B
35	28	*Language*	5	C
36	29	*Reading and Literature*	13	
37	31	*Reading and Literature*	8	B
38	31	*Reading and Literature*	13	C
39	32	*Reading and Literature*	13	B
40	32	*Reading and Literature*	15	B

* Answers are provided here for multiple-choice items only. Each open-response item has its own set of scoring guidelines which allow for valid alternate interpretations and responses.

III. Mathematics Retest

Mathematics Retest

The Mathematics Retest was based on learning standards in the Massachusetts *Mathematics Curriculum Framework* (2000). The *Framework* identifies five major content strands, listed below.

◗ Number Sense and Operations

◗ Patterns, Relations, and Algebra

◗ Geometry

◗ Measurement

◗ Data Analysis, Statistics, and Probability

The grades 9–10 learning standards for these strands appear on pages 72–75 of the *Mathematics Curriculum Framework*, which is available on the Department Web site at www.doe.mass.edu/frameworks/current.html.

In Test Item Analysis Reports, Mathematics retest results are reported under five MCAS reporting categories, which are identical to the five *Mathematics Curriculum Framework* content strands listed above.

Test Sessions

The Mathematics Retest included two separate test sessions, which were administered on consecutive days. Each session included multiple-choice and open-response items. Session 1 also included short-answer questions.

Reference Materials and Tools

Each student taking the Mathematics Retest was provided with a Grade 10 Mathematics Reference Sheet and was allowed to refer to it at any time during testing. A copy of the reference sheet follows the final question in this chapter.

During session 2, each student had sole access to a calculator with at least four functions and a square root key. Calculator use was not allowed during session 1.

The use of bilingual word-to-word dictionaries was allowed for limited English proficient students only during both Mathematics retest sessions. No other reference tools or materials were allowed.

Cross-Reference Information

The table at the conclusion of this chapter indicates each item's reporting category and the *Framework* learning standard it assesses. The correct answers for multiple-choice and short-answer items are also displayed in the table.

Mathematics
SESSION 1

You may use your reference sheet during this session.
*You may **not** use a calculator during this session.*

DIRECTIONS

This session contains fourteen multiple-choice questions, four short-answer questions, and three open-response questions. Mark your answers to these questions in the spaces provided in your Student Answer Booklet.

**1** What is the value of the expression below?

$$6 + 4(8 - 3)^2$$

A. 71

B. 106

C. 250

D. 406

2 Pat has $247.85 in savings. She wants to use part of her savings to buy computer software that costs $142.99 and an ink cartridge that costs $31.75.

Which of the following estimates is closest to the amount of money Pat will have left in her savings after she buys the computer software and the ink cartridge?

A. $75

B. $100

C. $175

D. $200

3 One of the shaded figures in the coordinate grid below is congruent to the other shaded figure.
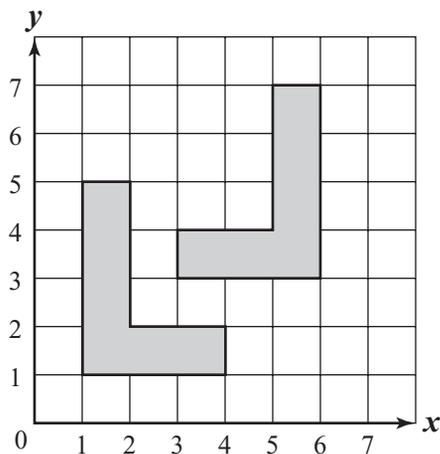
Which of the following describes a method used for transforming one figure onto the other figure?

A. a rotation only

B. a translation only

C. a dilation and a rotation only

D. a reflection and a translation only

4　What are the solutions of the quadratic equation below?

$$x^2 + 2x - 3 = 0$$

A. $x = 1$ or $x = 3$

B. $x = 1$ or $x = -3$

C. $x = -1$ or $x = 3$

D. $x = -1$ or $x = -3$

5　Which of the following is equivalent to the expression below?

$$24 \div 2^3 \cdot 2$$

A. $24 \div 4^3$

B. $24 \div 6 \cdot 2$

C. $24 \div 8 \cdot 2$

D. $24 \div (8 \cdot 2)$

6　Which of the following is closest to $\sqrt{125}$?

A. 10.8

B. 11.2

C. 11.8

D. 12.5

7　Which of the following is equivalent to the expression below?

$$(3x - 4)(2x + 6)$$

A. $6x^2 + 26x - 24$

B. $6x^2 + 18x - 24$

C. $6x^2 + 10x - 24$

D. $6x^2 - 8x - 24$

8 The scatterplot below shows the mean gas mileages obtained over a one-year period by 10 vehicles of different weights.

**Mean Gas Mileages
for Different Vehicle Weights**

**Vehicle Weight
(in pounds)**
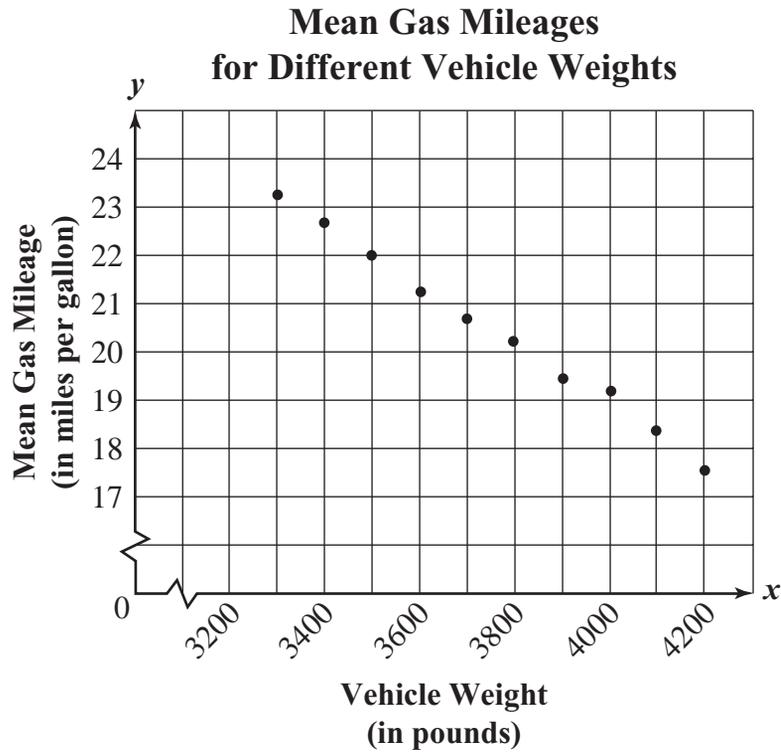
Which of the following most closely approximates the slope of the line of best fit for the data in the scatterplot?

A. -150

B. $-\frac{1}{150}$

C. $\frac{1}{150}$

D. 150

9 Which of the following properties is demonstrated by the equation below?

$$9(x + 3) = 9x + 27$$

A. distributive property

B. inverse property of addition

C. associative property of addition

D. commutative property of addition

11 What is the value of the expression below?

$$3^2 \left| -2 \right|$$

A. -18

B. -12

C. 12

D. 18

10 What is the solution to the following system of equations?

$$2x + 3y = 5$$
$$-x - 5y = 1$$

A. $(-2, 3)$

B. $(-1, 4)$

C. $(1, 1)$

D. $(4, -1)$

12 If $x \neq 0$, which of the following is equivalent to the expression below?

$$\frac{3x^4 - 2x^3 + 7}{x}$$

A. $3x^3 - 2x^2 + \frac{7}{x}$

B. $3x^3 - 2x^2 + 7$

C. $x^3 + \frac{7}{x}$

D. $x^3 + 7$

13 The table below shows a relationship between the values of x and y.

x	y
0	-3
1	-2
2	1
3	6
4	13

Which of the following equations describes this relationship for the values in the table?

A. $y = x - 3$

B. $y = 2x - 3$

C. $y = x^2 - 3$

D. $y = 2x^2 - 3$

14 A square with sides of length n units has an area of 55 square units. Which of the following is closest to the value of n?

A. 7.1 units

B. 7.4 units

C. 7.7 units

D. 7.9 units

41

Question 15 is a short-answer question. Write your answer to this question in the box provided in your Student Answer Booklet. Do not write your answer in this test booklet. You may do your figuring in the test booklet.

15   Twenty-eight movie critics rated a new movie on a scale of 1 to 100. The stem-and-leaf plot below shows the rating that each critic assigned to the movie.

Movie Ratings

Stem	Leaf
4	7
5	2 6 9
6	1 4 6 8 8
7	0 3 5 9
8	1 3 5 6 8 8 9
9	0 0 1 3 4 6 6 9

Key
6 │ 1 represents 61
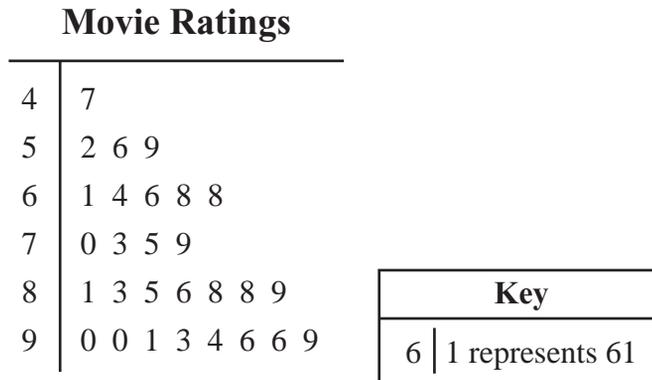
What is the range of the data in the stem-and-leaf plot?

Question 16 is a short-answer question. Write your answer to this question in the box provided in your Student Answer Booklet. Do not write your answer in this test booklet. You may do your figuring in the test booklet.

16 A trapezoid and its dimensions are shown below.
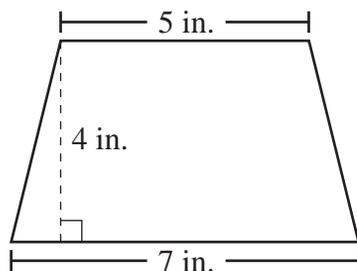
What is the area, in square inches, of the trapezoid?

Question 17 is an open-response question.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 17 in the space provided in your Student Answer Booklet.

17 Suppose the new operation ✦ is defined for all real numbers as shown below.

$$j \bigstar k = j \cdot k - j - k$$

For example: $8 \bigstar 3 = 8 \cdot 3 - 8 - 3 = 13$

a. What is the value of $6 \bigstar 5$? Show your work.

b. What is the value of $(-5) \bigstar (-2)$? Show your work.

c. Does $10 \bigstar 7 = 7 \bigstar 10$? Show your work or explain your reasoning.

d. Does $x \bigstar y = y \bigstar x$ for all real numbers x and y? Use the properties of operations on real numbers to explain your reasoning.

Questions 18 and 19 are short-answer questions. Write your answers to these questions in the boxes provided in your Student Answer Booklet. Do not write your answers in this test booklet. You may do your figuring in the test booklet.

18 There are 4 yellow tiles, 5 blue tiles, and 3 red tiles in a bag. All of the tiles are the same size and shape.

If a person randomly selects a tile from the bag without looking, what is the probability that the tile will be blue?

19 Isosceles triangle *RST* and the measure of ∠*S* are shown below.
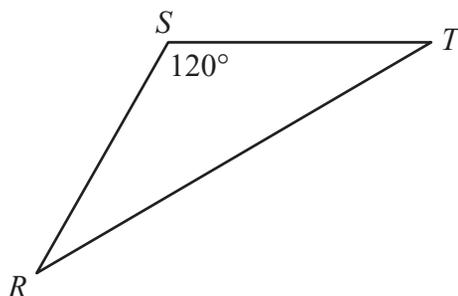
What is the measure, in degrees, of ∠*T* ?

Questions 20 and 21 are open-response questions.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF EACH QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 20 in the space provided in your Student Answer Booklet.

20   The table below shows a quadratic relationship between the values of x and y.

x	-5	-3	-1	1	3	5	7
y	26	10	2	2	10	26	50

a. Based on the relationship in the table, what is the value of y when $x = 9$? Show or explain how you got your answer.

b. For the values in the table, write a rule that describes y in terms of x.

c. Using your rule from part (b), what is a value of x when $y = 145$? Show or explain how you got your answer.

d. Is there another value of x, other than your answer in part (c), when $y = 145$?

- If your answer is "yes," give the value of x and explain your reasoning.
- If your answer is "no," explain your reasoning.

Write your answer to question 21 in the space provided in your Student Answer Booklet.

21   Jorge and Kelly both wrote reports on Thompson County. Each of them correctly plotted the same data points representing the county's population every ten years from 1900 through 1990, but they each made a different line graph of the data. Their line graphs are shown below.
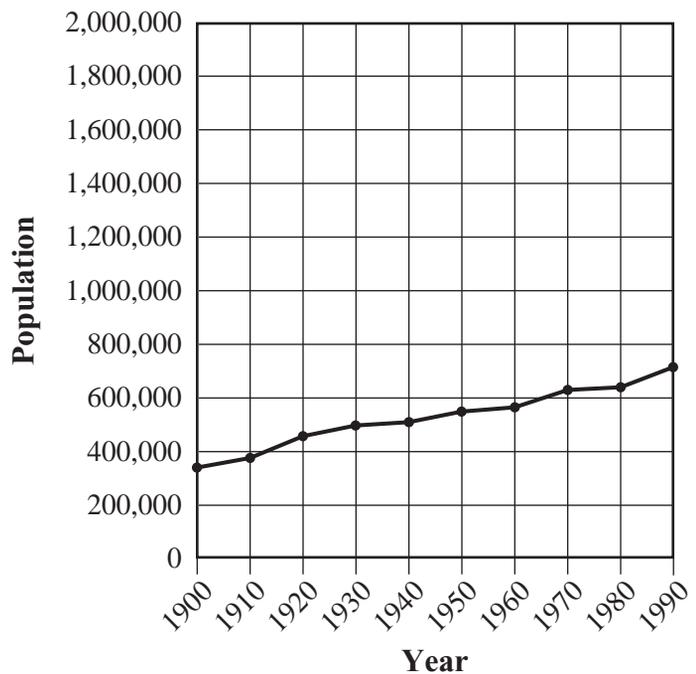
Graph 1:

Population of Thompson County from 1900 through 1990
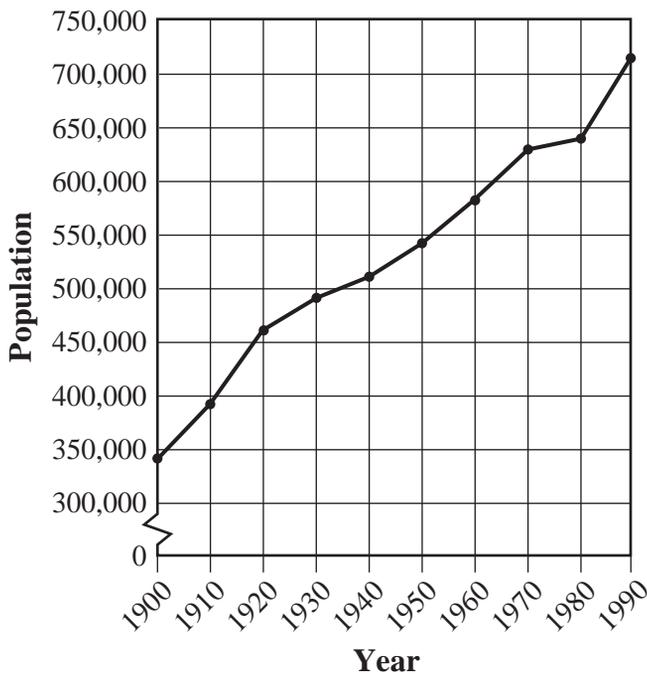
Graph 2:

Population of Thompson County from 1900 through 1990

a. What was the population of Thompson County in 1950? Explain your reasoning.

b. What is the range of the population of Thompson County from 1900 through 1990? Explain your reasoning.

c. Jorge claims that the county's population increased very slowly from 1900 through 1990. Kelly claims that the county's population increased very rapidly from 1900 through 1990.

     • Who made Graph 1? Explain your reasoning.

     • Who made Graph 2? Explain your reasoning.

d. Explain why the appearance of Jorge's graph is different from the appearance of Kelly's graph.

Mathematics
SESSION 2

You may use your reference sheet during this session.
You may use a calculator during this session.

DIRECTIONS
This session contains eighteen multiple-choice questions and three open-response questions. Mark your answers to these questions in the spaces provided in your Student Answer Booklet.

22 The amount of money a potter earns varies directly with the number of vases she makes. She earns $40 for making 5 vases. What is the amount of money she earns for making 4 vases?

A. $20

B. $24

C. $32

D. $50

23 Bob, Dana, Eric, and Jessica attend basketball practice after school each day. During basketball practice, each person attempts to make 30 free throws. The number of free throws made by each person during each of the 5 practices last week is shown below.

Numbers of Free Throws Made per Practice

Name	Mon.	Tue.	Wed.	Thu.	Fri.
Bob	22	20	25	20	28
Dana	25	17	17	24	27
Eric	16	23	14	29	23
Jessica	16	21	15	24	24

Which person made the **greatest** mean number of free throws per practice for the 5 practices last week?

A. Bob

B. Dana

C. Eric

D. Jessica

24   Christina has 20 comedy DVDs and 5 action DVDs. If she randomly selects one of the DVDs, what is the probability that she will select a comedy DVD?

A. 0.05

B. 0.25

C. 0.75

D. 0.80

25   The diagram below represents six locations in a park and the bicycle paths that connect them. The locations are labeled *P*, *Q*, *R*, *S*, *T*, and *U*. The length, in miles, of each path is shown.
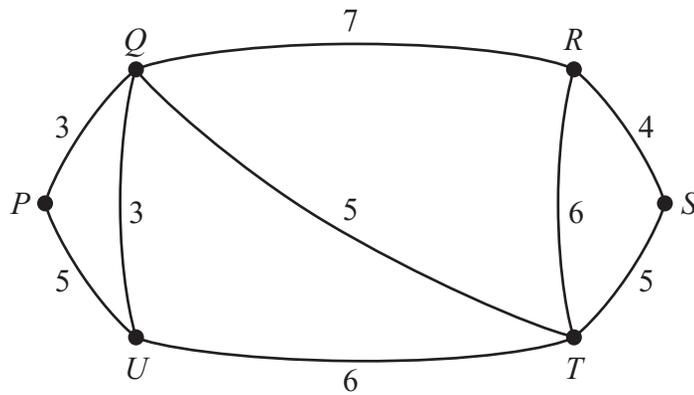
Jon rode his bicycle from location *P* to location *S* by taking the shortest route possible along the paths. What is the total number of miles he rode?

A. 11

B. 13

C. 14

D. 16

26 All 260 students in the senior class were polled to determine whether they prefer the gym (G), park (P), lake (L), or zoo (Z) for the location of Senior Fun Day. The bar graph below shows the results of the poll.

**Preferences for
Senior Fun Day Locations**
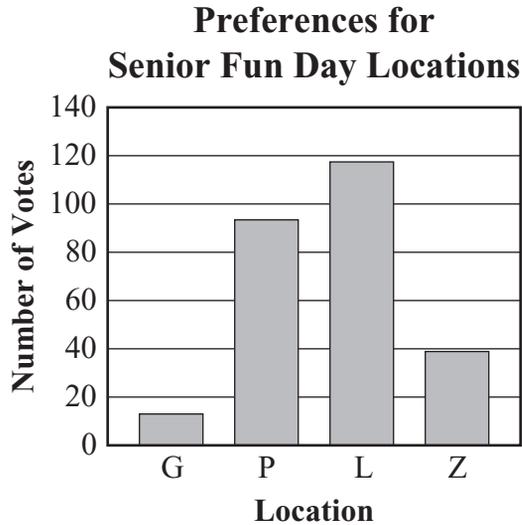
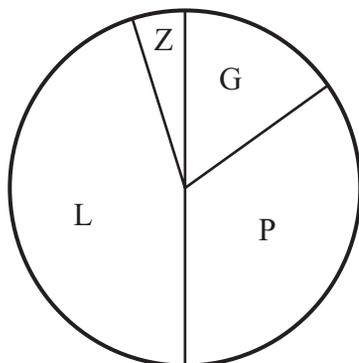Which of the following circle graphs best represents the data in the bar graph?
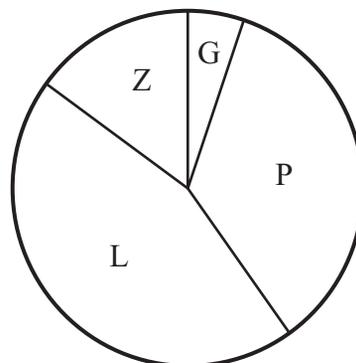
A. **Preferences for
Senior Fun Day Locations**
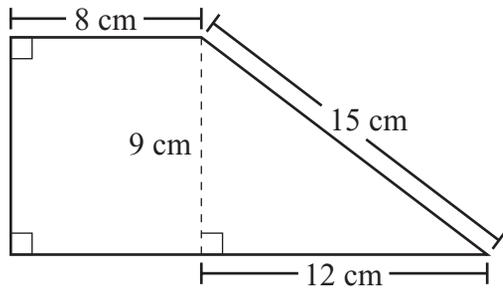

B. **Preferences for
Senior Fun Day Locations**
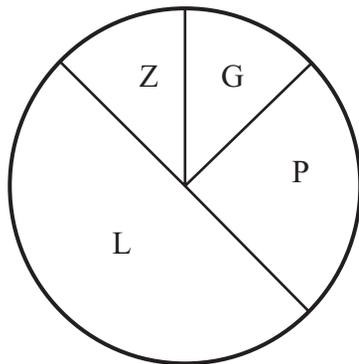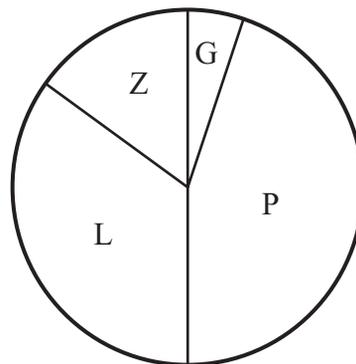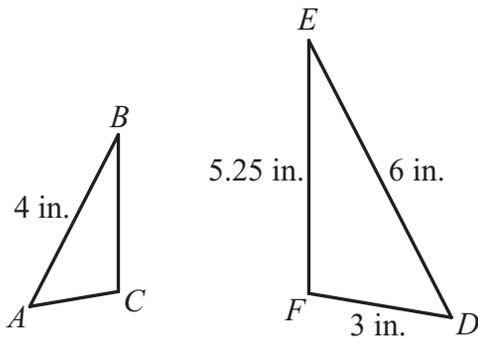

C. **Preferences for
Senior Fun Day Locations**

D. **Preferences for
Senior Fun Day Locations**

27 A trapezoid and some of its dimensions are shown below.

What is the perimeter of the trapezoid?

A.   44 cm

B.   52 cm

C. 126 cm

D. 180 cm

28 Two similar triangles are shown in the diagram below, where $\triangle ABC \sim \triangle DEF$.

Based on the dimensions in the diagram, what is the perimeter of $\triangle ABC$?

A. 9 in.

B. 9.5 in.

C. 10 in.

D. 10.5 in.

29 The formula for the nth term in a pattern of numbers is shown below.
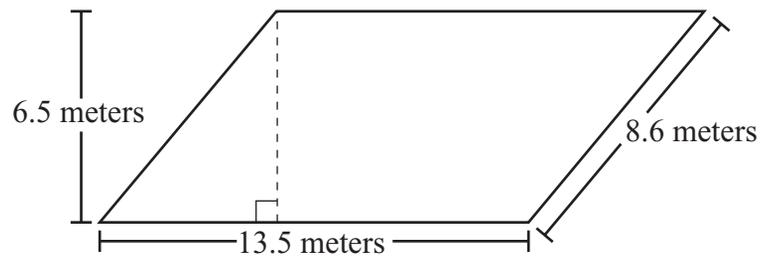
$$(n + 1)\, y^n$$

The first three terms are described below.

- When $n = 1$, the term is $2y$.
- When $n = 2$, the term is $3y^2$.
- When $n = 3$, the term is $4y^3$.

Which of the following is the term when $n = 6$?

A. $6y^5$

B. $6y^6$

C. $7y^5$

D. $7y^6$

51

30 A parallelogram and its dimensions are shown below.

Which of the following is closest to the perimeter of the parallelogram?

A. 22 meters

B. 44 meters

C. 88 meters

D. 116 meters

Question 31 is an open-response question.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 31 in the space provided in your Student Answer Booklet.

31 A car manufacturer is conducting safety tests on its newest car model. One of the tests determines the car's braking distance based on its speed. The test is performed on a dry, flat surface. The car manufacturer uses the equation below to determine the car's braking distance, d, in feet, given the car's speed, s, in miles per hour.

$$d = 0.06\,s^2$$

a. If the car's speed is 50 miles per hour, what will be the car's braking distance, in feet? Show or explain how you got your answer.

b. If the car's braking distance was 75 feet, what was the car's speed, to the nearest mile per hour? Show or explain how you got your answer.

c. Write an equation that can be used to determine a car's speed, s, in miles per hour, given the car's braking distance, d, in feet.

d. What is the ratio of the car's speed when its braking distance is 96 feet to the car's speed when its braking distance is 24 feet? Show or explain how you got your answer.

Mark your answers to multiple-choice questions 32 through 40 in the spaces provided in your Student Answer Booklet. Do not write your answers in this test booklet. You may do your figuring in the test booklet.

32　Rachel and Micah are selling energy bars to raise money for a school trip. The numbers of bars each of them sold per day for five days are shown in the table below.

**Numbers of Energy Bars
Sold per Day**

	Mon.	Tue.	Wed.	Thu.	Fri.
Rachel	14	17	11	11	22
Micah	14	12	15	15	19

Which of the following measures is the same for both Rachel's set of data and Micah's set of data?

A. mean

B. median

C. mode

D. range

33　A pole has a height of 10 feet. A rope is attached to the top of the pole and is anchored to the ground 24 feet away from the pole, as shown in the diagram below.
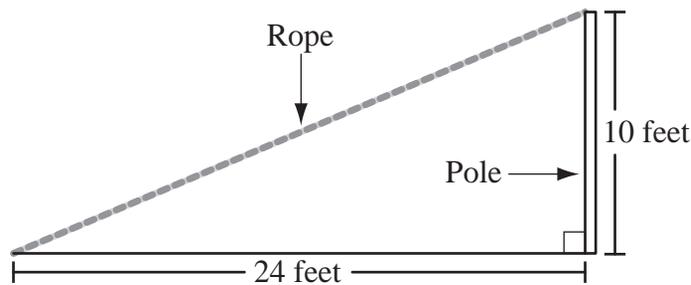
Assuming that the rope is straight, what is the length of the rope?

A. 22 feet

B. 26 feet

C. 30 feet

D. 34 feet

**34** Which of the following is closest to the circumference of a circle with a radius of 18 feet?

A. 113.04 feet

B. 226.08 feet

C. 1017.36 feet

D. 2034.72 feet

35 At a cafeteria, Vance can choose from 3 kinds of sandwiches, 5 kinds of vegetables, 3 kinds of desserts, and 2 kinds of soda.

What is the total number of different lunches that can be made from 1 kind of sandwich, 1 kind of vegetable, 1 kind of dessert, and 1 kind of soda?

A. 13

B. 21

C. 45

D. 90

36 The right square pyramid shown below has a base measuring 9 inches on each side and a height of 15 inches.
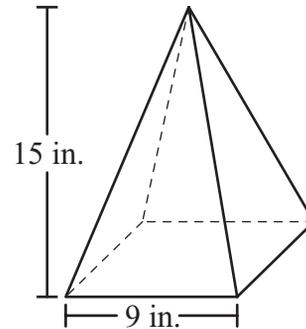
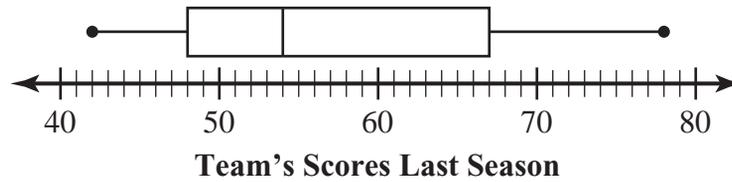What is the volume, in cubic inches, of the right square pyramid?

A. 135

B. 405

C. 540

D. 1215

37 What is the solution to the inequality below?

$$8x - 2 \geq 6x + 28$$

A. $x \geq 1\frac{6}{7}$

B. $x \geq 2\frac{1}{7}$

C. $x \geq 13$

D. $x \geq 15$

38　The basketball team at Buchanan High School played 21 games last season. The box-and-whisker plot below shows the distribution of the team's scores for all 21 games.

Team's Scores Last Season

Which of the following best represents the range of the team's scores for last season?
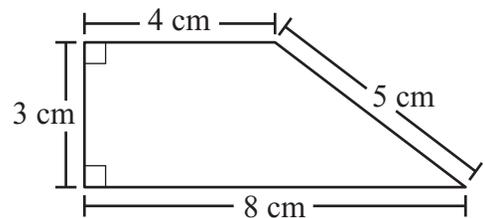
A. 19

B. 36

C. 54

D. 78

39　If $x \neq 0$, which of the following expressions belongs in the box below to make the equation true?

$$x + \boxed{\ ?\ } = 0$$

A.　x

B.　$\dfrac{1}{x}$

C.　$-x$

D.　$-\dfrac{1}{x}$

40　A trapezoid and its dimensions are shown below.


What is the area of the trapezoid?

A. 12 cm^2

B. 18 cm^2

C. 20 cm^2

D. 24 cm^2

Questions 41 and 42 are open-response questions.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF EACH QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 41 in the space provided in your Student Answer Booklet.

41   Bill has been hired to paint a grain bin on a local farm. The grain bin is shaped like a right circular cylinder with a right circular cone on top, with dimensions shown in the diagram below.

Grain Bin
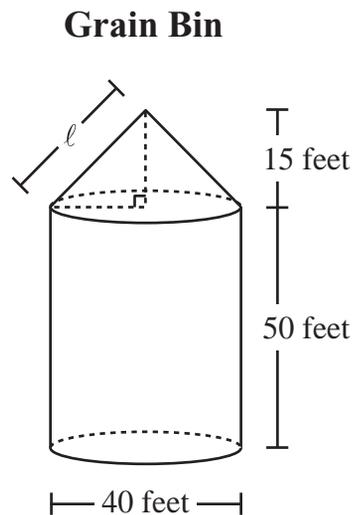
a. What is r, the radius, in feet, of both the cylinder and the cone? Show your work.

b. What is ℓ, the slant height, in feet, of the cone? Show your work.

The area that Bill will paint consists of the lateral surface area of the cylindrical part of the bin and the lateral surface area of the conical top.

c. What is the area, in square feet, that Bill will paint? Show your work.

d. One gallon of paint will cover 200 square feet of the bin. Based on your answer in part (c), how many gallons of paint are needed to cover the area that Bill will paint? Show your work.

Write your answer to question 42 in the space provided in your Student Answer Booklet.

42 Meadows Camp has several hiking trails. The trails are shown in the diagram below, where the numbers represent the time, in minutes, it should take to hike between any two locations.
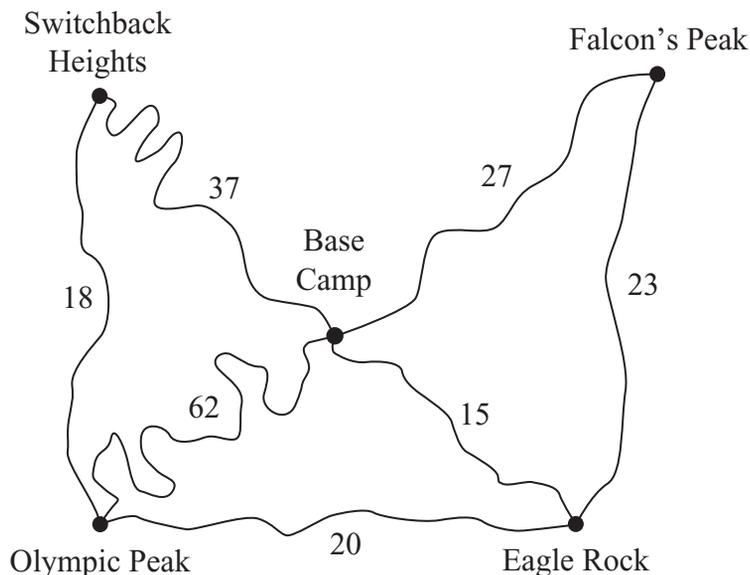

a. Based on the times shown in the diagram, what is the amount of time, in minutes, it should take a person to hike from Base Camp to Olympic Peak and then to Eagle Rock?
Show or explain how you got your answer.

b. Erin and Kyle are both hiking from Switchback Heights to Falcon's Peak.

  • Erin is hiking the trail from Switchback Heights to Base Camp and then to Falcon's Peak.

  • Kyle is hiking the trail from Switchback Heights to Olympic Peak to Eagle Rock and then to Falcon's Peak.

Based on the times shown in the diagram, who should get to Falcon's Peak in the least amount of time? Show or explain how you got your answer.

Jennifer wants to take the most challenging route possible from Olympic Peak to Falcon's Peak, without going to any one location more than once. She thinks the route that should take the greatest amount of time to complete will be the most challenging.

c. What are the six different routes that Jennifer can take **without** going to any one location more than once?

d. Using your answers from part (c), which route from Olympic Peak to Falcon's Peak should take the greatest amount of time to complete? Show or explain how you got your answer.
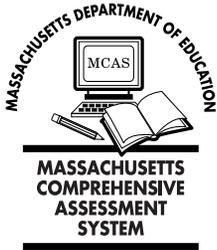
58

AREA FORMULAS

square .... $A = s^2$

rectangle .... $A = bh$

parallelogram .... $A = bh$

triangle .... $A = \frac{1}{2}bh$

trapezoid .... $A = \frac{1}{2}h(b_1 + b_2)$

circle .... $A = \pi r^2$

LATERAL SURFACE AREA FORMULAS

right rectangular prism .... $LA = 2(hw) + 2(lh)$

right circular cylinder .... $LA = 2\pi rh$

right circular cone .... $LA = \pi r\ell$
  (ℓ = slant height)

right square pyramid .... $LA = 2s\ell$
  (ℓ = slant height)

TOTAL SURFACE AREA FORMULAS

cube .... $SA = 6s^2$

right rectangular prism .... $SA = 2(lw) + 2(hw) + 2(lh)$

sphere .... $SA = 4\pi r^2$

right circular cylinder .... $SA = 2\pi r^2 + 2\pi rh$

right circular cone .... $SA = \pi r^2 + \pi r\ell$
  (ℓ = slant height)

right square pyramid .... $SA = s^2 + 2s\ell$
  (ℓ = slant height)

VOLUME FORMULAS

cube .... $V = s^3$
  (s = length of an edge)

right rectangular prism............ $V = lwh$

OR

$V = Bh$
(B = area of a base)

sphere .... $V = \frac{4}{3}\pi r^3$

right circular cylinder .... $V = \pi r^2 h$

right circular cone .... $V = \frac{1}{3}\pi r^2 h$
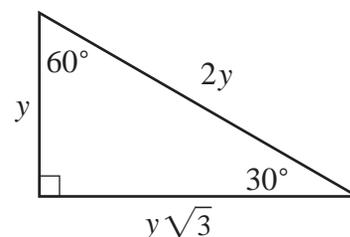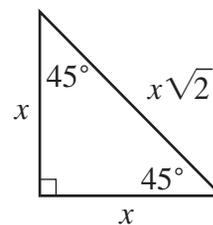
right square pyramid .... $V = \frac{1}{3}s^2 h$

CIRCLE FORMULAS

$C = 2\pi r$

$A = \pi r^2$

SPECIAL RIGHT TRIANGLES

59

Mathematics Retest
March 2007 Released Items:
Reporting Categories, Standards, and Correct Answers*

Item No.	Page No.	Reporting Category	Standard	Correct Answer (MC/SA)*
1	37	*Number Sense and Operations*	10.N.2	B
2	37	*Number Sense and Operations*	10.N.4	A
3	37	*Geometry*	10.G.9	D
4	38	*Patterns, Relations, and Algebra*	10.P.5	B
5	38	*Number Sense and Operations*	10.N.2	C
6	38	*Number Sense and Operations*	10.N.3	B
7	38	*Patterns, Relations, and Algebra*	10.P.3	C
8	39	*Data Analysis, Statistics, and Probability*	10.D.2	B
9	40	*Number Sense and Operations*	10.N.1	A
10	40	*Patterns, Relations, and Algebra*	10.P.8	D
11	40	*Number Sense and Operations*	10.N.2	D
12	40	*Patterns, Relations, and Algebra*	10.P.3	A
13	41	*Patterns, Relations, and Algebra*	10.P.1	C
14	41	*Number Sense and Operations*	10.N.3	B
15	42	*Data Analysis, Statistics, and Probability*	10.D.1	52
16	43	*Measurement*	10.M.1	24 square inches
17	44	*Number Sense and Operations*	10.N.1	
18	45	*Data Analysis, Statistics, and Probability*	8.D.4	5/12 or equivalent
19	45	*Geometry*	10.G.6	30°
20	46	*Patterns, Relations, and Algebra*	10.P.1	
21	47	*Data Analysis, Statistics, and Probability*	10.D.1	
22	48	*Patterns, Relations, and Algebra*	10.P.7	C
23	48	*Data Analysis, Statistics, and Probability*	10.D.1	A
24	49	*Data Analysis, Statistics, and Probability*	8.D.4	D
25	49	*Geometry*	10.G.11	B
26	50	*Data Analysis, Statistics, and Probability*	10.D.1	D
27	51	*Measurement*	10.M.1	B
28	51	*Geometry*	10.G.4	B
29	51	*Patterns, Relations, and Algebra*	10.P.1	D
30	52	*Measurement*	10.M.1	B
31	53	*Patterns, Relations, and Algebra*	10.P.7	
32	54	*Data Analysis, Statistics, and Probability*	10.D.1	A
33	54	*Geometry*	10.G.5	B
34	55	*Measurement*	10.M.1	A
35	55	*Data Analysis, Statistics, and Probability*	8.D.4	D
36	55	*Measurement*	10.M.2	B
37	55	*Patterns, Relations, and Algebra*	10.P.6	D
38	56	*Data Analysis, Statistics, and Probability*	10.D.1	B
39	56	*Number Sense and Operations*	10.N.1	C
40	56	*Measurement*	10.M.1	B
41	57	*Measurement*	10.M.2	
42	58	*Geometry*	10.G.11	

* Answers are provided here for multiple-choice items and short-answer items only. Each open-response item has its own set of scoring guidelines, which allow for valid alternate interpretations and responses.