Release of November 2010 MCAS Retest Items

January 2011
Massachusetts Department of Elementary and Secondary Education
# Table of Contents

*Commissioner's Foreword*

I. Document Purpose and Structure ................................................... 1  
II. English Language Arts Retest ..................................................... 4  
   A. Composition ........................................................... 5  
   B. Reading Comprehension .................................................. 7  
III. Mathematics Retest ............................................................. 36
Commissioner’s Foreword

Dear Colleagues:

The vision of the Department of Elementary and Secondary Education is to work in partnership with policymakers, communities, parents, school districts, and students to build a system that will prepare all students to succeed as productive and contributing members of our democratic society and the global economy. To assist in the achievement of this vision, the Department regularly releases MCAS test items to provide information regarding the kinds of knowledge and skills that students are expected to demonstrate. I am pleased to announce all questions from the November 2010 retests are included in this document.

The Release of November 2010 MCAS Retest Items is available only through the Department website 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 educators to use the relevant sections of this document together with their 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,

Mitchell D. Chester, Ed.D.
Commissioner of Elementary and Secondary 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 November 2010 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 can access electronically a November Retest Test Item Analysis Roster for English Language Arts and Mathematics. The rosters provide data generated from student responses. Each roster lists, for the school accessing the roster, the names of all enrolled students who took the November 2010 Retest in that roster’s content area, and shows how each student answered each test question (item) and the number of points earned on each constructed-response item. The rosters also label each item as multiple-choice, open-response, short-answer, or writing prompt and identify the item’s MCAS reporting category. Item numbers in this document correlate directly to the “Item Numbers” in the test item analysis roster.

Structure

Chapters II and III of this document contain, respectively, information for the November 2010 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. The first section also provides the Web address for the relevant framework and the page numbers on which the learning standards assessed by the test items in the chapter can be found. 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 November 2010 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.

Copyright information for all reading passages is provided in the document. Note that the Department has obtained permission to post all ELA passages that appear on its website. While the Department grants permission to use the posted test items for educational purposes, it cannot grant or transfer permission to use the passages that accompany the items. Such permission must be obtained directly from the holder of the copyright. 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 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 English Language Arts 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 website at www.doe.mass.edu/frameworks/current.html.

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 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 Scoring Guides for the MCAS English Language Arts Composition are available at www.doe.mass.edu/mcas/student/elacomp_scoreguide.html.

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.
WRITING PROMPT

Often works of literature feature two characters who disagree or do not understand each other.

From a work of literature you have read in or out of school, select two characters who disagree or do not understand each other. In a well-developed composition, identify the characters, describe their disagreement or misunderstanding, and explain how this disagreement or misunderstanding relates to the work as a whole.
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 website at [www.doe.mass.edu/frameworks/current.html](http://www.doe.mass.edu/frameworks/current.html).

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 website. For further information, contact Student Assessment Services at 781-338-3625.

**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.
In the article “Swimming to Antarctica,” Lynne Cox shows how she prepared for a successful attempt to swim one mile in Antarctic waters. In this excerpt, she describes a trial swim in the 33-degree waters of Admiralty Bay, Antarctica. The Orlova is her support boat. Read the excerpt and answer the questions that follow.

from *Swimming to Antarctica*

by Lynne Cox

1. When I stepped outside the Orlova, I was hit by a blast of glacial wind. Goose pimples rose up all over my body, and my hair whorled around my head like helicopter rotors. Quickly, I retreated into the ship, trying to conserve every calorie of body heat. The water temperature in Admiralty Bay was 33 degrees Fahrenheit, and the air temperature was thirty-four degrees, but the wind off the surrounding glaciers made it feel as if I were standing inside a freezer. Winding my hair around my hand and pushing it into either side of my swim cap, I went back outside and stepped onto the gangway. I looked up and saw clouds rushing past the glaciers. Holding my goggles in my left hand and clutching the railing, feeling the ice-cold metal against my feet, I walked down the stairs. Pausing for a moment, I saw the crew below in the three Zodiacs, looking tense and excited. When I reached the platform at the base of the gangway, I sat down, and it felt as if I were sitting on a wet metal ice-cube tray. The platform was swaying and rolling. The waves were an icy, silvery blue, breaking inches below my feet. I leaned backward to gain momentum and then threw myself forward.

2. The water was searing cold. I felt as if I were naked, standing still, and being sprayed with ice water from a high-pressure hose, and it took all my focus to move. I swam with my head above water, panting. It was incredibly difficult to catch my breath; my lungs felt as if they were being squeezed in a tight corset. I couldn’t get them to expand fully, but I needed oxygen. I knew that I wouldn’t be able to continue for more than a couple of minutes unless I overcame my inclination to hyperventilate. I forced myself to slow down, to pull in a breath through my mouth, and then to blow it all the way out. It was extremely tiring, but concentrating on my breath prevented me from thinking about the cold. As my breathing evened out, I began to notice other sensations. The water felt different from any other water I’d swum in, as if it were more solid than fluid, as though I were swimming through a liquid Sno-Kone. I checked my hands. They were red and swollen and, like my feet, had become numb and achy. I was barely kicking, but I always swam this way: ninety-nine per cent of my propulsion through the water comes from my arms and upper body, while my legs just stabilize my stroke. One friend, who

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1 Zoeloci — small, inflatable power boats
had spent years studying polar bears, told me I swam like a polar bear, which uses its feet as a rudder, probably, he said, as a means of containing heat. Because I wasn’t kicking, I wasn’t pumping much blood to my feet and legs. I paused in mid-stroke to look at my watch. I had been swimming for only a minute.

A wave shattered in my face. I choked, and started to panic. I knew I had to keep swimming; it was too cold to stop. I kept spinning my arms, trying to swallow and clear my throat. Another wave slammed into my face. I was choking harder, and feeling even more panicked. I couldn’t breathe. I considered rolling over onto my back, but decided it was too cold and this would slow me down too much. Instead, I put my head into the water so that I was no longer choking on the spray. My body flattened, and I began swimming through the water instead of climbing up against it. It was easier to breathe; I could roll my head and shoulder to one side or the other. I was almost swimming normally, pulling, pushing, gliding through the water, slipping under the waves, letting them wash over me, each stroke strong and fluid. As I moved across the sub-Antarctic sea, I looked at the glaciers that encircled the harbor. My torso and head felt warm on the inside, and I relaxed just a little. Turning my head left on a breath, then right on another breath, then lifting my head up, I looked at the faces of the crew, which were filled with concern. I lifted my right foot out of the water and waved it. This was a signal that everything was O.K. They grinned and waved back.

When I glanced at my watch again, I saw that I had reached my goal of ten minutes. But the more I could do now, I thought, the more confidence I would have for the final swim; indeed, if the weather turned, this could be my only opportunity to swim. When I reached the fifteen-minute mark, I glanced down and saw five or six streams of bubbles that looked like vapor trails in the sky—penguins were swimming so fast underneath me that all I could see was their bubbles. To my left were icebergs. We were moving into their float path, and the crew began shouting warnings to me, pointing at the water. I swam around the bergs, and my arms started to feel colder. I could see that we were getting closer to the beach, but the intensity of the cold was sapping my strength. Large chunks of ice were floating all around me, drifting at a rate of about a knot, parallel to the beach. The entire crew was on full alert, helping me to steer through the iceberg field. A piece the size of a soccer ball bounced off my forehead, and it brought hot tears to my eyes. Another piece, twice as big, hit me on the side of the head. I shook my head to ease the pain, and increased my speed, trying to get clear of the ice field.

The crew got out of the boats and scrambled up the embankment, waiting for me with towels and blankets. Ten feet from shore, I saw smooth gray rocks, and then the bottom rose up to meet me. I turned my head to breathe, and saw some of the passengers from the Orlova who had been hiking along the shore. They were running toward us, slipping a little on the ice, and waving. As I stood up, I heard cheers and muffled clapping. I had surprised everyone, including myself. I’d planned to swim for only ten minutes, but I had been in the water for twenty-two minutes and fourteen seconds. The crew surrounded me, blocking the wind and drying me off. In a few moments, I felt very cold. My legs were bright red, and bleeding from tiny scratches made by pieces of ice in the water. My feet and legs felt numb. A crew member took off his boots and helped me put them on, and we trudged across the rocks. Crossing a small brook,
we entered one of the yellow buildings I’d seen from the Orlova, where three startled Polish
researchers, who were studying water samples, greeted us. I lay down in a corner, wrapped in
blankets, and shivered violently as two doctors, one on either side, helped me to rewarm. One
of the doctors then measured my temperature; it had dropped only a little, to 97.7 degrees. It
was much higher than expected. Still, I was shaking hard, and my teeth were chattering, but this
activity was raising my metabolism and creating heat to counteract the return of cooled blood
to the core. It was nearly forty-five minutes before I stopped shivering and felt warm again.


1. According to the excerpt, what was the main purpose of the author’s trial swim?
A. to enhance her reputation
B. to bring attention to the region
C. to learn how to adapt to the conditions
D. to determine the best route to the shore

2. Read the phrase from paragraph 1 in the box below.

... my hair whorled around my head like helicopter rotors.

What is the purpose of the comparison in the phrase?
A. to show the size of the bay
B. to show how cold the air was
C. to show how fast the boat was
D. to show the power of the wind

3. Based on the excerpt, what was the role of the people in the Zodiacs?
A. to transport tourists
B. to perform experiments
C. to ensure the author’s safety
D. to write about the author’s swim

4. According to paragraph 2, how was the water different from any other the author had swum in?
A. It was bluer.
B. It was thicker.
C. It was more slippery.
D. It was more transparent.
5. According to paragraph 2, how are the author and the polar bear alike?

A. They both expand their lungs in order to insulate themselves from the cold.
B. They both keep their core temperatures high by keeping their legs still.
C. They both move quickly through the water.
D. They both prefer to swim on their backs.

6. Read the sentences from the beginning of paragraph 3 in the box below.

- A wave shattered in my face.
- I choked, and started to panic.
- I couldn't breathe.

Now read the sentence from later in paragraph 3 in the box below.

I was almost swimming normally, pulling, pushing, gliding through the water, slipping under the waves, letting them wash over me, each stroke strong and fluid.

What is the purpose of transitioning from the short sentences early in the paragraph to the longer sentence later in the paragraph?

A. to show how much warmer the water became
B. to represent the increasing stillness of the water
C. to represent the change from distressed swimming to smooth swimming
D. to show that the author noticed her surroundings when she changed her swimming
7. Read the sentence from paragraph 5 in the box below.

I’d planned to swim for only ten minutes, but I had been in the water for twenty-two minutes and fourteen seconds.

What is the most likely reason the author is so specific about the time?

A. to emphasize that the crew is excited for her
B. to show the dangers she had faced in the water
C. to emphasize the significance of her accomplishment
D. to show that the swim was easier than she thought it would be

8. What is the meaning of hyperventilate in paragraph 2?

A. move with a lot of energy
B. breathe too rapidly
C. hold one’s breath
D. lose one’s focus

Question 9 is an open-response question.

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

Write your answer to question 9 in the space provided in your Student Answer Booklet.

9. Based on the excerpt, explain how the author’s mental strength enabled her to successfully complete the swim. Support your answer with relevant and specific information from the excerpt.
Notice the interesting format of this poem about a snowstorm. Read the poem and answer the questions that follow.

**blizzard**

the snow
has forgotten
how to stop
it falls
stuttering
at the glass
a silk windsock
of snow
blowing
under the porch light
tangling trees
which bend
like old women
snarled
in their own
knitting
snow drifts
up to the step
over the doorsill
a pointillist’s* blur
the wedding
of form and motion
shaping itself
to the wish of
any object it touches

...as the whole
alphabet
of silence
falls out of the sky

— Linda Pastan

* pointillist — an artist who applies paint in small dots that appear to blend together when seen from a distance

10. Read the lines from the poem in the box below.

- the snow / has forgotten / how to stop
- a white bear / shaking its paw / at the window

What is the effect of the personification in the lines?

A. It shows how intelligent nature is.
B. It captures the energy of the storm.
C. It shows how friendly the speaker is.
D. It emphasizes the problems the storm creates for people.

11. What is the speaker describing in lines 23–27?

A. how soft the snow is
B. how blinding the snow is
C. how the falling snow varies in intensity
D. how the snow creates an outline of buried things

12. Which of the following best explains the oxymoron “alphabet of silence” in lines 46 and 47?

A. The speaker is speechless but wants to write a poem.
B. The speaker is both tired and restless at the same time.
C. The storm is soundless but communicative to the speaker.
D. The storm is both threatening and fascinating to the speaker.

13. What is the most likely reason the poet does not use punctuation or stanza breaks?

A. to represent the fatigue of the speaker
B. to suggest the storm is like a work of art
C. to represent the continuous action of the storm
D. to emphasize the vivid language in the poem
English Language Arts

Reading Comprehension: Session 2

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.

Frank McCourt wrote the memoir Teacher Man about teaching English in tough New York City schools. Read this excerpt about his first day in the classroom and answer the questions that follow.

from Teacher Man
by Frank McCourt

Here they come.
And I’m not ready.
How could I be?
I’m a new teacher and learning on the job.

On the first day of my teaching career, I was almost fired for eating the sandwich of a high school boy. On the second day I was almost fired for mentioning the possibility of friendship with a sheep. Otherwise, there was nothing remarkable about my thirty years in the high school classrooms of New York City. I often doubted if I should be there at all. At the end I wondered how I lasted that long.

The problem of the sandwich started when a boy named Petey called out, Anyone wan’ a baloney sandwich?
You kiddin’? Your mom must hate you, givin’ you sandwiches like that.
Petey threw his brown-paper sandwich bag at the critic, Andy, and the class cheered. Fight, fight, they said. Fight, fight. The bag landed on the floor between the blackboard and Andy’s front-row desk.
I came from behind my desk and made the first sound of my teaching career: Hey. Four years of higher education at New York University and all I could think of was Hey.
I said it again. Hey.
They ignored me. They were busy promoting the fight that would kill time and divert me from any lesson I might be planning. I moved toward Petey and made my first teacher statement, Stop throwing sandwiches. Petey and the class looked startled. This teacher, new teacher, just stopped a good fight. New teachers are supposed to mind their own business or send for the principal or a dean and everyone knows it’s years before they come. Which means you can have a good fight while waiting. Besides, what are you gonna do with a teacher who tells you stop throwing sandwiches when you already threw the sandwich?
Benny called out from the back of the room. Hey, teach, he awredy threw the sangwidge. No use tellin’ him now don’t throw the sangwidge. They’s the sangwidge there on the floor.

The class laughed. There’s nothing sillier in the world than a teacher telling you don’t do it after you already did it. One boy covered his mouth and said, Stoopid, and I knew he was referring to me. I wanted to knock him out of his seat, but that would have been the end of my teaching career. Besides, the hand that covered his mouth was huge, and his desk was too small for his body.

Someone said, Yo, Benny, you a lawyer, man? and the class laughed again. Yeah, yeah, they said, and waited for my move. What will this new teacher do?

Professors of education at New York University never lectured on how to handle flying-sandwich situations. They talked about theories and philosophies of education, about moral and ethical imperatives, about the necessity of dealing with the whole child, the gestalt, if you don’t mind, the child’s felt needs, but never about critical moments in the classroom.

Should I say, Hey, Petey, get up here and pick up that sandwich, or else? Should I pick it up myself and throw it into the wastepaper basket to show my contempt for people who throw sandwiches while millions starve all over the world?

They had to recognize I was boss, that I was tough . . .

The sandwich, in wax paper, lay halfway out of the bag and the aroma told me there was more to this than baloney. I picked it up and slid it from its wrapping. It was not any ordinary sandwich where meat is slapped between slices of tasteless white American bread. This bread was dark and thick, baked by an Italian mother in Brooklyn, bread firm enough to hold slices of a rich baloney, layered with slices of tomato, onions and peppers, drizzled with olive oil and charged with a tongue-dazzling relish.

I ate the sandwich.

It was my first act of classroom management. My mouth, clogged with sandwich, attracted the attention of the class. They gawked up at me, thirty-four boys and girls, average age sixteen. I could see the admiration in their eyes, first teacher in their lives to pick up a sandwich from the floor and eat it in full view. Sandwich man. In my boyhood in Ireland we admired one schoolmaster who peeled and ate an apple every day and rewarded good boys with the long peel. These kids watched the oil dribble down my chin to my two-dollar tie from Klein-on-the-Square.

Petey said, Yo, teacher, that’s my sandwich you et.

Class told him, Shaddap. Can’t you see the teacher is eating?

I licked my fingers. I said, Yum, made a ball of paper bag and wax paper and flipped it into the trash basket. The class cheered. Wow, they said, and Yo, baby, and M-a-a-a-n. Look at dat. He eats the sandwich. He hits the basket. Wow.

So this is teaching? Yeah, wow. I felt like a champion. I ate the sandwich. I hit the basket. I felt I could do anything with this class. I thought I had them in the palm of my hand. Fine, except I didn’t know what to do next. I was there to teach, and wondered how I should move from a sandwich situation to spelling or grammar.
or the structure of a paragraph or anything related to the subject I was supposed to teach, English.

My students smiled till they saw the principal’s face framed in the door window. Bushy black eyebrows halfway up his forehead shaped a question. He opened the door and beckoned me out. A word, Mr. McCourt?

Petey whispered, Hey, mister. Don’t worry about the sandwich. I didn’t want it anyway.

The class said, Yeah, yeah, in a way that showed they were on my side if I had trouble with the principal, my first experience of teacher-student solidarity. In the classroom your students might stall and complain but when a principal or any other outsider appeared there was immediate unity, a solid front.

Out in the hallway, he said, I’m sure you understand, Mr. McCourt, it isn’t seemly to have teachers eating their lunch at nine a.m. in their classrooms in the presence of these boys and girls. Your first teacher experience and you choose to begin it by eating a sandwich? Is that proper procedure, young man? It’s not our practice here, gives children the wrong idea. You can see the reasoning, eh? Think of the problems we’d have if teachers just dropped everything and began to eat their lunches in class, especially in the morning when it’s still breakfast time. We have enough trouble with kids sneaking little nibbles during morning classes and attracting cockroaches and various rodents. Squirrels have been chased from these rooms, and I won’t even mention rats. If we’re not vigilant these kids, and some teachers, your colleagues, young man, will turn the school into one big cafeteria.

I wanted to tell him the truth about the sandwich and how well I handled the situation, but if I did it might be the end of my teaching job. I wanted to say, Sir, it was not my lunch. That was the sandwich of a boy who threw it at another boy and I picked it up because I’m new here and this thing happened in my class and there was nothing in the courses at college on sandwiches, the throwing and retrieving of. I know I ate the sandwich but I did it out of desperation or I did it to teach the class a lesson about waste and to show them who was in charge or . . . I ate it because I was hungry and I promise never to do it again for fear I might lose my good job though you must admit the class was quiet. If that’s the way to capture the attention of kids in a vocational high school you ought to send out for a pile of baloney sandwiches for the four classes I still have to meet today.

I said nothing.

The principal said he was there to help me because, Ha, ha, I looked like I might need a lot of help. I’ll admit, he said, you had their full attention. OK, but see if you can do it in a less dramatic way. Try teaching. That’s what you’re here for, young man. Teaching. Now you have ground to recover. That’s all. No eating in class for teacher or student.

I said, Yes, sir, and he waved me back to the classroom.

The class said, What’d he say?

He said I shouldn’t eat my lunch in the classroom at nine a.m.

You wasn’t eatin’ no lunch.
I know, but he saw me with the sandwich and told me not to do it again.

Man, that's unfair.

Petey said, I'll tell my mom you liked her sandwich. I'll tell her you got in a lot of trouble over her sandwich.

All right, Petey, but don't tell her you threw it away.

Naw, naw. She'd kill me. She's from Sicily. They get excited over there in Sicily.

Tell her it was the most delicious sandwich I ever had in my life, Petey.

OK.

Teacher Man: A Memoir by Frank McCourt. Copyright © 2005 by Green Peril Corp. Reprinted by permission of Scribner, a division of Simon & Schuster, Inc.

14 How did the events in the excerpt represent “critical moments in the classroom” for the author?

A. He was trying to learn how to manage the students.
B. He was trying to recall what he learned about handling problems.
C. He was trying to decide if he had enough talent to continue as a teacher.
D. He was trying to determine the appropriate punishment for the students.

15 Read the sentence from paragraph 2 in the box below.

Otherwise, there was nothing remarkable about my thirty years in the high school classrooms of New York City.

What does the sentence suggest about the author’s teaching career?

A. The first few days were the saddest for him.
B. The first few days were the most vivid in his memory.
C. The first few days featured the only mistakes he made in his career.
D. The first few days caused him to think about choosing a new career.
16. What do the author’s comments in paragraphs 6–8 most strongly imply?
   A. He resented the students for taking advantage of his inexperience.
   B. He was concerned that he would be reported if he was too strict.
   C. He realized he was unprepared for the reality of the classroom.
   D. He realized he could never be friends with his students.

17. Read the sentence from paragraph 8 in the box below.

   New teachers are supposed to mind their own business or send for the principal or a dean and everyone knows it’s years before they come.

   What does the sentence represent?
   A. the author’s beliefs about school discipline
   B. the students’ way of looking at the situation
   C. the statement about fighting in the school handbook
   D. the discussion students had before the author appeared

18. Based on the excerpt, what is the most likely reason the author ate the sandwich?
   A. He hoped it would hide his nervousness from his students.
   B. He wanted to teach his students to appreciate their parents.
   C. He hoped it would help to establish his control of the class.
   D. He intended to make a point about unnecessary school rules.

19. In paragraph 17, what does the use of the word “gawked” suggest?
   A. how angry the author was
   B. how foolish the author felt
   C. how surprised the students were
   D. how apprehensive the students were
20 What is revealed about the students in paragraphs 23 and 24?

A. They had been unfair to their teacher.
B. They had begun to respect their teacher.
C. They had more tricks to play on their teacher.
D. They had created difficulties for their teacher.

21 In paragraph 25, what does the word vigilant mean?

A. tidy
B. helpful
C. impolite
D. watchful

Question 22 is an open-response question.

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

Write your answer to question 22 in the space provided in your Student Answer Booklet.

22 Based on the excerpt, explain how the author shows the humor of the situation. Support your answer with relevant and specific details from the excerpt.
A father’s “magical” qualities are seen through the eyes of his young son in this excerpt from the novel World’s Fair. Donald is the narrator’s older brother. Read the excerpt and answer the questions that follow.

from **WORLD’S FAIR**

by E. L. Doctorow

1. Donald was like my mother in applying himself resolutely to the demands and challenges of life. My father was a different sort. I thought he got to where he was by magic.
2. He would let me watch him shave because I rarely saw him except in the mornings. He came home from work long after my bedtime. With a partner, he owned a music store in the Hippodrome, a famous theater building on Sixth Avenue and Forty-third Street in Manhattan.
3. “Good morning, Sunny Jim,” he said. He had noticed early in my life that each morning I woke smiling, an act of such extraordinary innocence that he had ever since commented upon it. When I was a baby he lifted me into his arms and we played a game: he puffed up his cheeks like a hippopotamus and I punched the air out, first one side of his face, then the other. No sooner was the job done than his eyes went wide and his cheeks refilled and I had gigglingly to do it all over again.
4. The bathroom was lined in squares of white tile and all the fixtures were white porcelain. An opaque crinkled window seemed to glow with its own light. My father stood in the diffuse sunlight of the white bathroom after he had partially dressed—shoes, trousers, ribbed undershirt, suspenders looping off his flanks—and brought his shaving soap to a lather in its mug. Then he applied the lather to his face with an artful slopping of his shaving brush.
5. He did this while humming the overture to Wagner’s *The Flying Dutchman.*

6. I loved the scratchy sound the brush made on his skin. I loved the soap as it turned from a froth to a substantive lather under his rubbing. Next, he held taut from its hook on the wall a long leather strop about three inches wide, and upon this he wielded his straight razor back and forth with a twist of the wrist. I failed to understand how something as soft as leather could hone something as hard as a steel razor. He explained the principle to me, but I knew it was just another example of his magic powers.

7. My father did sleight-of-hand things. He could appear to remove the top joint of his thumb, for example, and then put it back. Behind the screen of one hand, you’d see the thumb of the other come apart and then the space between the two halves. Like all good tricks, it was horrifying. He’d lift the thumb off and then put it back with a little twist, and hold it out for my inspection and wiggle it to assure me that it was as good as new.

*The Flying Dutchman — a famous German opera*
He was full of surprises. He punned. He made jokes. As he shaved, here and there tiny springs of blood quietly leaked through the white foam and turned pink. He did not seem to notice but simply went on shaving and humming.

After he had rinsed his face and patted it with witch hazel, he parted his shiny black hair in the middle and combed each side back. He was always well barbered. His handsome pink face shone. He smoothed his dark moustache with the tips of his fingers. He had a thin straight nose. He had vivid sparkling brown eyes that sent out signals of a mischievous intelligence.

Assiduously he applied the lather remaining in his shaving mug to my cheeks and chin. In the medicine cabinet was one of my wooden tongue depressors; every time I required a visit from our family physician, Dr. Gross, I was given a new one as a present. My father handed me a depressor so that I could shave.

"Dave," called my mother as she rapped on the door. "You know what time it is? What do you do in there!"

He grimaced, ducking his head between his shoulders, as if we were, both of us, naughty boys.

My father always made promises as he went off to work.

"I'll be home early tonight," he told my mother.

"I have no money," she said.

"Here's a couple of dollars to tide you over. I'll have cash this evening. I'll call you. Maybe I can pick up some things for dinner."

I pulled on his sleeve and begged him to bring me a surprise.

"Well, I'll just see what I can do," he said, smiling.

"You promise?"

Donald was already at school. When my father left I'd have nothing to look forward to, so I watched him to the last second. He was portly, though trim enough in one of his suits with the vest buttoned tight. He checked the knot of his tie in the mirror in the front hall. When he set his fedora on his head at the stylish angle he affected, I ran into the parlor so as to be able to see him as he came out the front door. Down the steps he skipped, and turning to wave, and smiling at me as I stood in the parlor window, he strode off down the street in that brisk jaunty gait of his. I watched him turn the corner and from one moment to the next he was out of sight.

I understood the reach of his life. I understood him as living by nature as a sojourner. He went forth and returned. He covered ground. His urges and instincts even on his one day off pointed away from home.

He rarely kept his word to return in time for dinner or to bring me something. My mother could not abide his broken promises. She was forever calling him to account. I saw that this did no good. By way of compensation he brought me things when I least expected them. A surprise surprised. It was a kind of teaching.
23. How does the excerpt expand upon the ideas the narrator presents in paragraph 1?
A. The excerpt shows the mother's frustration with the father.
B. The excerpt shows the narrator's fascination with his father.
C. The excerpt shows how the narrator and his brother are different.
D. The excerpt shows how the mother works hard to achieve things.

24. Read paragraph 8 in the box below.

He was full of surprises. He punned. He made jokes.

What is the main effect of the paragraph?
A. It emphasizes the narrator's anger.
B. It emphasizes the father's impatience.
C. It emphasizes the father's playfulness.
D. It emphasizes the narrator's innocence.

25. How does paragraph 14 signal a turning point in the narrator's recollections?
A. It shows the close relationship between his mother and father.
B. It introduces a new perspective on his father's character.
C. It establishes his feelings about his mother and father.
D. It emphasizes the monotony of his father's day.

26. Read paragraph 1 in the box below.

Donald was like my mother in applying himself resolutely to the demands and challenges of life. My father was a different sort. I thought he got to where he was by magic.

Which of the following is the best replacement for resolutely in the first sentence?
A. with determination
B. with intelligence
C. with happiness
D. with passion
Question 27 is an open-response question.

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

Write your answer to question 27 in the space provided in your Student Answer Booklet.

27 Based on the excerpt, explain what the narrator learns about life from his father. Support your answer with relevant and specific information from the excerpt.
This excerpt describes the variety of migration routes and practices that exist among different types of birds. Read the excerpt and answer the questions that follow.

**MIGRATING**

by Jan Mahnken

1. Eighty percent of North America's 645 species of birds move some distance seasonally, including the so-called altitudinal or vertical migration — that is, up and down mountains. We become very aware of birds during their spring and fall migrations because they gather in flocks and are highly visible and audible.

2. No one knows who first observed the seasonal movements of birds, but certainly the phenomenon has always interested bird watchers. Our earliest surviving writings, including the Bible, talk about bird migration. Aristotle mentioned migration but also insisted that birds didn't migrate, they went into hiding at the end of the summer. Others, he said, transmuted: At the onset of summer, the European robin promptly changed into the European redstart! My favorite explanation of migration is one proposed by an Englishman who said birds flew to the moon (it took sixty days), but since there was nothing to eat there, they went into hibernation.

3. City folk can observe migrations as easily as suburban and rural dwellers. As a matter of fact, the city is apt to be an especially good place to observe migration because small green yards amidst great expanses of concrete and asphalt are havens that can attract large numbers of migrants. Bird watchers in places such as Central Park in New York City may well see more species than do their country counterparts.

4. Divers — pelicans, gannets, cormorants, herons, storks, ducks, geese, swans — and raptors are all migratory. Many shorebirds are migrants. The black-billed and yellow-billed cuckoos are migrants, and the burrowing owl is migratory in the North. Nightjars

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**Long-Distance Travelers**

All of our North American hummingbirds migrate. The ruby-throated hummingbird migrates to and from the Yucatán, at between 30 and 40 mph. The sexes migrate separately — the male arrives first — and move northward as flowers appear. They fly about 25 feet above land or water.

**Hibernation?**

We can chuckle at the ancients' notion of birds hibernating, but some birds exhibit torpid behavior that mimics hibernation. A banded whip-poor-will, for example, was found in the same crevice in the mountains of southeastern California during three successive winters, its normal temperature of 106°F depressed to 64°–67°F. Lesser nighthawks and several species of swifts and hummingbirds have been discovered in a similar condition during cold snaps when insects are scarce. The torpid condition conserves energy significantly.

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1 Yucatán — an area of Mexico
migrate, and so do swifts. Chimney swifts fly north in groups of twenty to thirty, but migrate south by the hundreds.

Flickers and yellow-bellied sapsuckers are migrants. Flycatchers, swallows, and martins migrate, and many thrushes are long-distance migrants. Pipits move south; shrikes retreat irregularly from the northernmost part of their ranges. Most vireos and warblers are long-distance migrants. Orchard orioles leave the North in July, immediately after nesting; northern (Baltimore) orioles don’t leave until September or October. Tanagers are long-distance migrants.

**Why and How**

Though it is widely believed that birds migrate to escape cold weather, they’re actually almost perfectly adapted to withstand extremes of temperature. They migrate to ensure a food supply. Some birds, primarily insect eaters, start south immediately after the molt following nesting. Others hang around for the fall crop of grains, berries, and fruits.

The migration of some birds is much more conspicuous than that of others. One day it may occur to you that you haven’t seen an oriole for at least a week, but it’s hard to miss the rowdy congregations of blackbirds that gather in the fall before heading south. The restless movements of birds before migration tend toward the direction of their eventual migration.

Long-distance migration is not necessarily a nonstop marathon. In western Massachusetts, where I live, we begin watching for the Canada geese right after Labor Day. Our location offers what they like — a small lake a couple of miles up the road, hay meadows, and many fields of silage corn. They drift in slowly, and by mid-October our town is playing host to hundreds of geese. Visitors to the lake feed them bread by hand, but when the geese are foraging in the fields they won’t permit a near approach. On water they congregate mostly in one large flock, while their forays to the fields may be in large or small flocks. We see them flying often as they perform their various activities. Once the corn is cut they feed well, flying so low over our house to the field next door that we can see their feathers. They leave at the end of November when the lake begins to freeze.

**Bird Banding**

One way scientists have been able to track the seasonal movements of birds is through bird banding. This procedure involves attaching a metal ring stamped with date and location to the leg of a captured bird. If that bird is captured again, the band gives birders information on its movements. This procedure allows the records of millions of birds to be analyzed electronically. Widespread use of banding, by thousands of birders all over the world, amasses mountains of useful information on the movements of birds.

The practice of banding birds to get an idea of their migratory movements started in 1740 in Europe when Johann Leonhard Frisch, a German, tied red strings to the legs of swallows. Anyone else capturing the swallows could find out where they had come from. John James Audubon used the procedure on a couple of phoebes in the early part of the nineteenth century.

---

2 *molt* — the loss of feathers  
3 *silage corn* — corn used for animal feed
Most birds travel latitudinally — north to south. Some, however, have longitudinal migrations, from west to east; the evening grosbeaks that nest in northern Minnesota and winter in New England are an example. The common ground dove is mostly a permanent resident in the deep South, but it tends to move seasonally toward the coasts.

Fly-by-Nights

The migration of some species is inconspicuous not only because it occurs at night but also because night flyers travel at a higher altitude than day flyers. Nocturnal migrants, such as thrushes, wrens, warblers (except the yellow-rumped warblers), and sparrows, tend to be relatively weak flyers; by day, they feed on the ground or in plants, as usual. Strong flyers that feed on the wing, like swallows, are diurnal, or daytime, travelers. One day swarms of them infest the telephone wires; the next day they’re gone. Hawks, strong flyers that normally have a large range, also migrate during the day, as do geese and other large birds. Geese also travel at night. Ducks and shorebirds are nocturnal, or show no particular preference.

Dangers En Route

Once on their way, the travelers frequently experience difficulties. Though running into human-built structures causes thousands and thousands of deaths, weather-related deaths are far more devastating. Sometimes birds are observed in the grips of “reversed” migration — flying in the wrong direction. Small birds are known to travel at about the speed of the wind, and to migrate downwind. Consequently, if the wind is going in the “wrong” direction, so are the birds. Many birds perish in early snowstorms. Birds traveling along a coast may be blown out to sea. Costly as it is, the semiannual trek proceeds on schedule, a phenomenon fraught with mystery.

fraught with — filled with

"Migrating" by Jan Mahnken, from The Backyard Bird-Lover’s Guide. Copyright © 1998 by Storey Communications, Inc. Reprinted by permission of Storey Publishing, LLC.
28 According to the excerpt, which of the following is the main reason birds migrate?

A. to nest  
B. to reproduce  
C. to find warm weather  
D. to find abundant food

29 What is the main focus of paragraph 2?

A. how birds change form  
B. early bird migration theories  
C. the popularity of bird watching  
D. the reasons ancient cultures liked birds

30 According to the sidebar “Hibernation?” why do some birds exhibit behavior that mimics hibernation?

A. to stay dry  
B. to trick predators  
C. to save their strength  
D. to protect their young

31 How does the author support her points differently in paragraph 8 than in the other paragraphs?

A. She quotes other bird experts.  
B. She refers to scientific studies.  
C. She draws on personal experience.  
D. She includes historical perspectives.

32 Based on paragraph 10, what is the key difference between nocturnal migrants and diurnal ones?

A. Diurnal migrants are solo flyers.  
B. Diurnal migrants are better flyers.  
C. Diurnal migrants have a larger range.  
D. Diurnal migrants have better eyesight.

33 Based on the excerpt, what is the main purpose of banding birds?

A. to learn about their migration patterns  
B. to observe their social behaviors  
C. to train them to carry messages  
D. to keep them from migrating.
34. What does the author imply at the end of the excerpt?

A. Global warming will affect migration.
B. Birds are foolish to attempt migration.
C. There is a lot we need to learn about migration.
D. People should be more careful of birds during migration.

35. Which of the following words is the best context clue to understand the meaning of the word "transmuted" in paragraph 2?

A. others
B. onset
C. promptly
D. changed

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. Explain the author's main purpose in the excerpt and how she achieves it. Support your answer with relevant and specific information from the excerpt.
Fiddler on the Roof is a well-known musical about arranged marriages in a small Jewish community in nineteenth-century Russia. Yente is a matchmaker, someone who finds potential spouses for people in her town in exchange for a fee. Shprintze, Hodel, Tzeitel, and Bielke are Golde's daughters. Read the excerpt and answer the questions that follow.

from *Fiddler on the Roof*  
by Joseph Stein

Students read an excerpt from *Fiddler on the Roof* and then answered questions 37 through 40 that follow on page 34 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.

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Due to copyright restrictions, the selection that appeared on this page cannot be released to the public over the Internet. For more information, see the citation on page 30.
Due to copyright restrictions, the selection that appeared on this page cannot be released to the public over the Internet. For more information, see the citation on page 30.
37. Which of the following best explains what Golde means by her comment in line 3?

A. She is unhappy to see Yente.
B. She thinks Shprintze is smart.
C. She fears Hodel is being sinful.
D. She is hoping to have Tzeitel wed.

38. Based on lines 11–17, which of the following best describes Golde's response to Tzeitel's complaints?

A. She feels Tzeitel should be grateful to get a husband at all.
B. She sympathizes with Tzeitel's desire for romance.
C. She laughs at Tzeitel's views about marriage.
D. She advises Tzeitel to speak with her father.

39. Based on lines 40–46, why is Yente suspicious of Motel?

A. She worries that Motel might harm Tzeitel.
B. She thinks that Motel might talk badly about her.
C. She thinks that Motel might be too ignorant for Tzeitel.
D. She worries that Motel might interfere with her matchmaking.

40. Based on the excerpt, what would Golde and Yente say is the most important ingredient to making a successful match?

A. money
B. wisdom
C. true love
D. physical appearance
### English Language Arts
**Reading Comprehension Retest**
**November 2010 Released Items:**
*Reporting Categories, Standards, and Correct Answers*

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Page No.</th>
<th>Reporting Category</th>
<th>Standard</th>
<th>Correct Answer (MC)*</th>
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<tr>
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*A answers are provided here for multiple-choice items only.*
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 website at www.doe.mass.edu/frameworks/current.html.

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.
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. The area of a rectangle is 48 square centimeters. The width of the rectangle is 3 centimeters. What is the length of the rectangle?
   A. 16 centimeters
   B. 21 centimeters
   C. 42 centimeters
   D. 45 centimeters

2. What is the value of the expression below?
   \[2[3 - 3(4 - 1)]\]
   A. −20
   B. −12
   C. 0
   D. 24

3. The bar graph below shows the number of cell phones a store sold each week during the past eight weeks.

   Cell Phones Sold

   What is the median number of cell phones sold per week for these eight weeks?
   A. 13
   B. 18
   C. 23
   D. 26
4. What is the value of the expression below?

\[ 3 \cdot (-4)^2 \]

A. 48  
B. 24  
C. -24  
D. -48

5. The table below shows a relationship between values of \( x \) and \( y \).

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Which of the following equations describes the relationship between \( x \) and \( y \) for the values in the table?

A. \( y = x + 2 \)  
B. \( y = 3x - 1 \)  
C. \( y = x - 5 \)  
D. \( y = 2x + 1 \)

6. Which of the following is closest to the value of the expression below?

\[ \sqrt{\frac{160}{16}} \]

A. 3  
B. 5  
C. 10  
D. 40
The scatterplot below shows the sales income that a store made in each of its first seven years of business.

Based on the line of best fit for the scatterplot, which of the following is closest to the sales income that the store could expect to make in year 10?

A. $75,000
B. $85,000
C. $110,000
D. $130,000

Which of the following expressions equals \((-4)\)?

A. \((-4) \cdot (-1)\)
B. \((-4) \cdot \left(\frac{1}{4}\right)\)
C. \((-4) \cdot (1)\)
D. \((-4) \cdot (4)\)

The ages, in years, of the six students in a cooking class are shown in the box below.

14, 16, 20, 18, 14, 14

What is the mean age, in years, of the students?

A. 14
B. 15
C. 16
D. 19
10. Which of the following is equivalent to the expression below?

\[ 7x - 3 - 4x + 2 \]

A. \( 3x - 1 \)
B. \( 3x + 1 \)
C. \( 11x - 5 \)
D. \( 11x + 5 \)

11. Four line segments are shown on the coordinate grid below.

Which of the line segments has a slope of 0?

A. \( \overline{PQ} \)
B. \( \overline{QR} \)
C. \( \overline{RS} \)
D. \( \overline{ST} \)

12. What is the value of the expression below?

\[ 2^3 + 4^2 \]

A. 14
B. 20
C. 24
D. 36
13 Jamell recorded the number of miles he ran each week for the past five weeks, as shown in the box below.

11, 14.5, 10, 17, 9.5

Based on the data in the box, which of the following estimates is closest to the total number of miles Jamell ran during the past five weeks?

A. 50  
B. 60  
C. 70  
D. 80

14 What is the value of the expression below?

\[4(3 + 7 - 12) - (-3)^2\]

A. \(-17\)  
B. \(-2\)  
C. 1  
D. 11
Questions 15 and 16 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.

15 A n antiques dealer paid $40 for a clock. She then sold the clock for 225% of the price she paid for it.
For what price did she sell the clock?

16 M s. Dumont kept a record of the numbers of students enrolled in foreign language classes at Central High School during the past 20 years. She used her data to make the box-and-whisker plot shown below.

Based on M s. Dumont's plot, what is the range of the numbers of students enrolled in foreign language classes?
Matthew makes picture frames to sell. It takes Matthew the same amount of time to make each frame.

The table below shows the numbers of frames Matthew can make based on how many hours he works. For example, he can make 12 frames in 4 hours.

<table>
<thead>
<tr>
<th>Number of Hours Worked (h)</th>
<th>Number of Frames Made (f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>8</td>
<td>24</td>
</tr>
</tbody>
</table>

a. How many frames can Matthew make in 7 hours? Show or explain how you got your answer.

b. Write an equation that can be used to determine the number of frames, f, that Matthew can make in h hours.

c. How many frames can Matthew make in 25 hours? Show or explain how you got your answer.

d. How many hours does Matthew need to work to make 159 frames? Show or explain how you got your answer.
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. In the diagram below, \( \triangle QRS \cong \triangle NMP \).

What is the length, in inches, of \( \overline{MP} \)?
Write your answer to question 19 in the box provided in your Student Answer Booklet.

19 What is the y-intercept of the line represented by the equation below?

\[ 2x + y = -8 \]
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 first three figures in a pattern are shown below.

Figure 1 Figure 2 Figure 3

The pattern continues by adding one row and one column to each figure to make the next figure. The table below shows the number of rows, the number of columns, and the total number of dots in each of Figures 1, 2, and 3.

<table>
<thead>
<tr>
<th>Figure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>...</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Rows</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Columns</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Number of Dots</td>
<td>2</td>
<td>6</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Determine the following for Figure 4:

- number of rows
- number of columns
- total number of dots

Show or explain how you got each of your answers.

b. What is the total number of dots in Figure 20? Show or explain how you got your answer.

c. Write an expression in terms of \( n \) that represents the number of rows in Figure \( n \). Show or explain how you got your answer.

d. Write an expression in terms of \( n \) that represents the number of columns in Figure \( n \). Show or explain how you got your answer.

e. Write an expression in terms of \( n \) that represents the total number of dots in Figure \( n \). Show or explain how you got your answer.
The table below shows the number of posters sold each weekday at a music store during a sale.

<table>
<thead>
<tr>
<th>Day</th>
<th>Mon.</th>
<th>Tue.</th>
<th>Wed.</th>
<th>Thu.</th>
<th>Fri.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number Sold</td>
<td>10</td>
<td>14</td>
<td>6</td>
<td>16</td>
<td>14</td>
</tr>
</tbody>
</table>

a. What is the range of the numbers of posters sold each weekday? Show or explain how you got your answer.

b. What is the mode of the numbers of posters sold each weekday? Show or explain how you got your answer.

c. What is the mean of the numbers of posters sold each weekday? Show or explain how you got your answer.

The sale was extended through Saturday and Sunday. The mean of the numbers of posters sold each day over the 7-day period was 15.

d. What was the total number of posters sold on Saturday and Sunday? Show or explain how you got your answer.
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 diagram below shows a triangle.

![Diagram of a triangle with angle measures]

Based on the angle measures in the diagram, what is \( x \)?

A. 28°  
B. 29°  
C. 30°  
D. 32°

23 A right rectangular prism has the following measurements:

- The height is 12 centimeters.
- The length is 2 centimeters.
- The total surface area is 244 square centimeters.

What is the width of the prism?

A. 7 centimeters  
B. 10 centimeters  
C. 14 centimeters  
D. 17 centimeters

24 Which of the following is the graph of the solution of the inequality below?

\[ |x| > 3 \]

A. 

```
-4 -3 -2 -1 0 1 2 3 4
```

B. 

```
-4 -3 -2 -1 0 1 2 3 4
```

C. 

```
-4 -3 -2 -1 0 1 2 3 4
```

D. 

```
-4 -3 -2 -1 0 1 2 3 4
```
Allie counted the number of pine trees and the number of maple trees in each of seven study areas. She made a scatterplot of her data, where each point represents one study area.

Allie found that, in general, the larger the number of pine trees in a study area, the smaller the number of maple trees. Which of the following is most likely Allie's scatterplot?
26. Point P has coordinates (2, 5). After a translation, the coordinates of its image P’ are (4, −1). Which of the following best describes the translation?
A. right 1 unit, down 4 units
B. right 2 units, down 4 units
C. right 2 units, down 6 units
D. right 4 units, down 1 unit

27. Four congruent right triangles are cut off the corners of a square. The diagram below shows the dimensions of the square and the congruent right triangles.

What is the area of the shaded part of the diagram?
A. 18 sq. in.
B. 20 sq. in.
C. 28 sq. in.
D. 34 sq. in.

28. In the diagram below, \( \triangle HJK \sim \triangle LMK \).

Based on the dimensions in the diagram, what is the length of \( JK \)?
A. 3 in.
B. 4 in.
C. 5 in.
D. 6 in.
29. Solve the equation below.

\[ x(x + 4) = 0 \]

A. \( x = 0; \ x = -4 \)
B. \( x = 0; \ x = 4 \)
C. \( x = -4 \)
D. \( x = 4 \)

30. Mr. Jovic made the stem-and-leaf plot below to show the noon temperatures, in degrees Fahrenheit (°F), on 14 days.

<table>
<thead>
<tr>
<th>Noon Temperatures (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

Key

5|6 represents 56

Based on the stem-and-leaf plot, what was the range of the temperatures?

A. 34°F
B. 38°F
C. 52°F
D. 54°F
A n office manager must make copies of a document. There are two copiers in the office, Copier X and Copier Y.

• Copier X makes 36 copies per minute.
• Copier Y makes 45 copies per minute.

a. How many copies can Copier X make in 17 minutes? Show or explain how you got your answer.

b. How many minutes will it take Copier Y to make 540 copies? Show or explain how you got your answer.

The office manager used both copiers to make a total of 3240 copies. Both copiers started and ended at the same time.

c. How many copies per minute did the two copiers make together? Show or explain how you got your answer.

d. How many minutes did it take the office manager to make the 3240 copies using both copiers? Show or explain how you got your answer.

e. When the office manager made the 3240 copies, how many more copies were made by Copier Y than by Copier X? 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. The diagram below shows rectangle \(\text{PQRS}\), its dimensions in units, and its diagonals \(\overline{PR}\) and \(\overline{QS}\).

![Diagram of rectangle PQR with dimensions 2 and \(2\sqrt{3}\) for sides SR and SQ respectively.]

Based on the dimensions in the diagram, what is the length, in units, of \(\overline{QS}\)?

A. \(2\sqrt{2}\)
B. 4
C. \(4\sqrt{3}\)
D. 6

33. A number sequence is described in the box below.

- The first term of the sequence is 1.
- Each term after the first term is determined by multiplying the previous term by 3 and then subtracting 1.

What is the fourth term of the sequence?

A. 2
B. 5
C. 11
D. 14
34. The diagram below shows a right square pyramid and some of its measurements.

What is the lateral surface area of the pyramid?

A. 900 sq. ft.
B. 1500 sq. ft.
C. 2400 sq. ft.
D. 3000 sq. ft.

35. The diagram below represents a lawn and its measurements.

What is the area of the lawn?

A. 10,200 sq. ft.
B. 8,850 sq. ft.
C. 7,650 sq. ft.
D. 6,600 sq. ft.
Each of 120 students purchased one beverage during lunch period today. The chart below shows the types of beverages purchased and the number of students who purchased each type.

### Numbers of Students Who Purchased Beverages

<table>
<thead>
<tr>
<th>Type of Beverage</th>
<th>juice</th>
<th>bottled water</th>
<th>milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Students</td>
<td>22</td>
<td>54</td>
<td>44</td>
</tr>
</tbody>
</table>

What is the probability that a student selected at random from the 120 is one who purchased bottled water during the lunch period?

- A. 33%
- B. 40%
- C. 45%
- D. 54%

Mr. Leto plans to save money to buy a carpet. If he saves $50 each week for 30 weeks, he will have saved the exact amount of money needed to buy the carpet.

If Mr. Leto instead saves $75 each week, how many weeks will it take him to save the same amount of money?

- A. 15
- B. 20
- C. 40
- D. 45

The cooking times, in minutes, for ten different meals are listed in the box below.

30, 50, 20, 45, 20, 15, 20, 40, 20, 40

What is the range, in minutes, of the cooking times?

- A. 10
- B. 20
- C. 25
- D. 35
The area of a rectangle is 108 square feet. The length of the rectangle is 3 times the width.
What is the width of the rectangle?

A. 6 feet  
B. 9 feet  
C. 27 feet  
D. 36 feet

Four terms of a geometric sequence are shown below.

4, __, 100, 500, 2500, . . .

What is the missing term in the sequence?

A. 5  
B. 10  
C. 20  
D. 50
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 A park manager is designing four different flower gardens.

- Each garden will have a different shape.
- Each garden will have an area of 64 square feet.

a. Draw a sketch of a garden that is shaped like a rectangle and has an area of 64 square feet. Be sure to label all the dimensions needed to determine the area.

b. Draw a sketch of a garden that is shaped like a triangle and has an area of 64 square feet. Be sure to label all the dimensions needed to determine the area.

c. Draw a sketch of a garden that is shaped like a trapezoid with bases of different lengths and has an area of 64 square feet. Be sure to label all the dimensions needed to determine the area.

d. Draw a sketch of a garden that is shaped like a circle and has an approximate area of 64 square feet. Be sure to label all the dimensions needed to determine the area.
42. The diagram below shows a kite.

![Kite Diagram](image)

a. What is the measure, in degrees, of \( \angle JGF \)? Show or explain how you got your answer.
b. What is the length, in inches, of \( HF \)? Show or explain how you got your answer.
c. What is the length, in inches, of \( EF \)? Show or explain how you got your answer.
d. What is the length, in inches, of \( EG \)? Show or explain how you got your answer.
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

VOLUME FORMULAS

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

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

CIRCLE FORMULAS

C = 2\pi r
A = \pi r^2

SPECIAL RIGHT TRIANGLES

45° \hspace{1cm} 45° \hspace{1cm} x\sqrt{2}

45° \hspace{1cm} x \hspace{1cm} \sqrt{x^2}

60° \hspace{1cm} 2y \hspace{1cm} y\sqrt{3}

30° \hspace{1cm} y \hspace{1cm} y\sqrt{3}
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<thead>
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<th>Item No.</th>
<th>Page No.</th>
<th>Reporting Category</th>
<th>Standard</th>
<th>Correct Answer (MC/SA)*</th>
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<td>A</td>
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<td>10.N.2</td>
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*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.