Student Name _____

High School Mathematics Test Booklet

Student Tutorial

TEST BOOKLET SECURITY BARCODE

1118074 1 2 3 4 5 A B C D E Printed in the USA ISD20570

Unit 1

Directions:

Today, you will be taking Unit 1 of the High School Student Tutorial. The following tasks are provided as an opportunity for you to practice with the different kinds of questions and response types that will be included in the PARCC Assessments. These items are from the practice tests and sample sets posted at http://parcc.pearson.com/.

Throughout the tutorials you will see hints in boxes at the top of the item pages, to help you answer questions and understand the directions. These hints are not in the actual test, but available only in the tutorials. The directions below will be used during the actual test. During the tutorial, please make sure you understand the directions, and ask your teacher if you have any questions.

Read each question carefully. Some items will ask you to choose one correct answer, while others will ask you to choose one or more answers. Mark your answers by filling in the circles in your test booklet.

Do not make any stray marks in the test booklet. If you need to change an answer in your test booklet, be sure to erase your first answer completely.

Calculator Directions:

In the first section of this unit, you may not use a calculator. You will not be allowed to return to the non-calculator section of the test after you have started the calculator section of the test.

If you do not know the answer to a question, skip it and go on. If you finish the non-calculator section of Unit 1 early, you may review your answers and any questions you may have skipped in the non-calculator section ONLY.

Do NOT go on to the calculator section in Unit 1 until directed to do so.

Using multiple-choice and multiple-select items:

Multiple-choice items have four answer choices and allow a single answer choice to be selected.

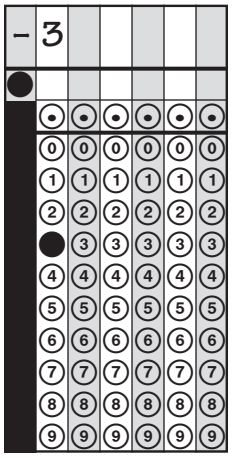
Multiple-select items have five to eight answer choices and allow for one or more answer choices to be selected.

Mark your answers by filling in the circles in your Test Booklet for the answer you choose.

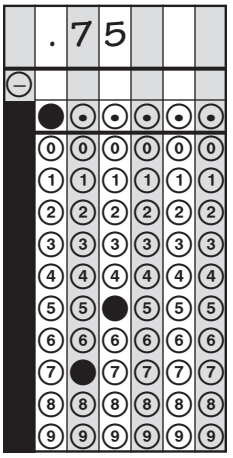
Directions for Completing the Answer Grids

1. Work the item and find an answer.
2. Write your answer in the boxes at the top of the grid.
   - Print only one digit or symbol in each box. You may not need all the boxes to enter an answer, but do not leave a blank box in the middle of an answer.
3. Under each box in which you wrote your answer, fill in the bubble that matches the number or symbol you wrote above.
   - Fill in one and ONLY one bubble for each box. Do not fill in a bubble under an unused box.
   - Fill in each bubble by making a solid mark that completely fills the circle.
   - Fractions cannot be entered into an answer grid and will not be scored. Enter fractions as decimals.
4. See below for examples on how to correctly complete an answer grid.

To enter −3, fill in the answer grid as follows



To enter .75, fill in the answer grid as follows



Practice filling in the circles in your test booklet.

Unit 1 - Section 1 (Non-Calculator)

The directions below will be used during the actual test. For the tutorial, please make sure you understand the directions, and ask your teacher if you have any questions. At the end of each section, go back and review any items you did not answer in that section.

This unit has two sections: a non-calculator and a calculator section.

You will now take the first section of this unit in which you may not use a calculator. You will not be allowed to return to the non-calculator section of the unit after you have started the calculator section. You will need to finish both sections within the allotted testing time.

Once you finish the non-calculator section, read the directions in your Test Booklet on how to continue.

HINT: Multiple-choice items have four answer choices with one correct answer. Completely fill in the bubble in front of the correct answer choice. Only one bubble should be filled.

M41919P_3

1. The cost to manufacture x pairs of sunglasses can be represented by a function $C(x)$. If it costs \$398 to manufacture 4 pairs of sunglasses, which of the following is true?

Select the correct equation.

Ⓐ $C(4) = 99.50$

Ⓑ $C(398) = 4$

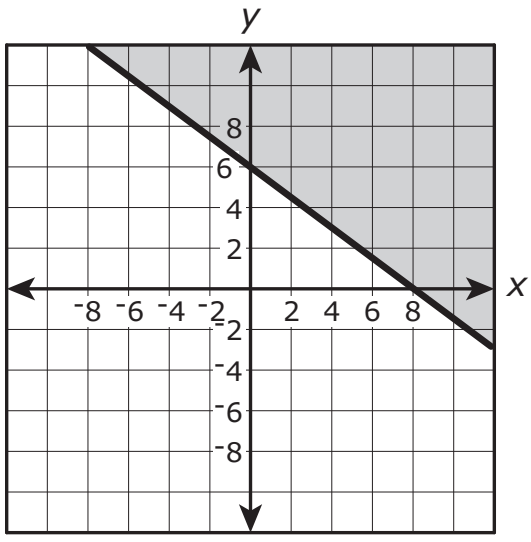
Ⓒ $C(4) = 398$

Ⓓ $C(99.50) = 1$

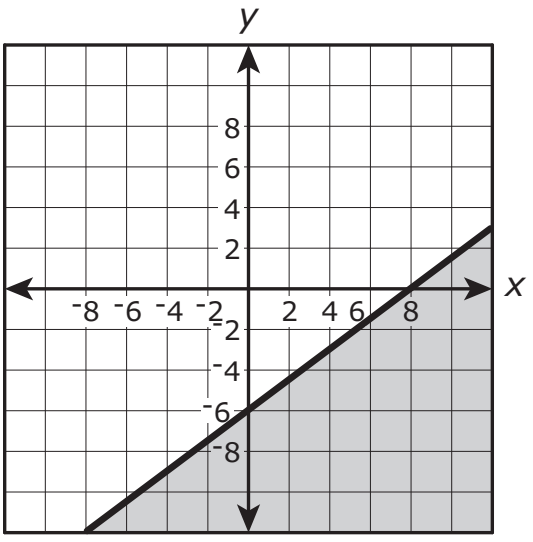
VF943123_3

2. Which is a graph of the solution set of the inequality $3x - 4y \leq 24$?

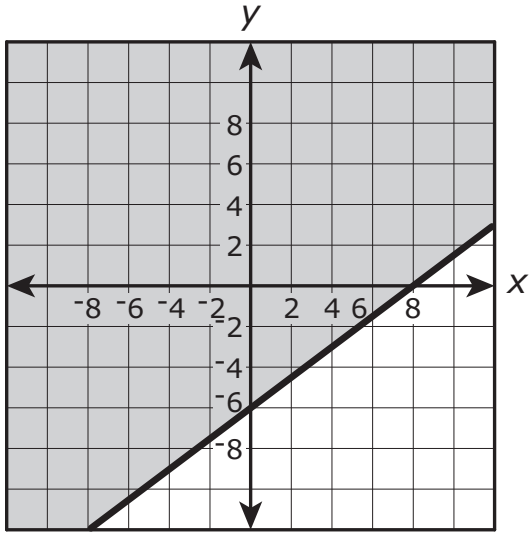
Ⓐ



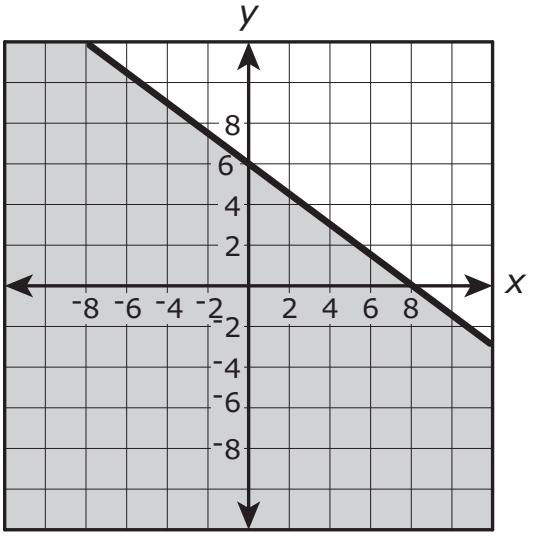
Ⓑ



Ⓒ



Ⓓ

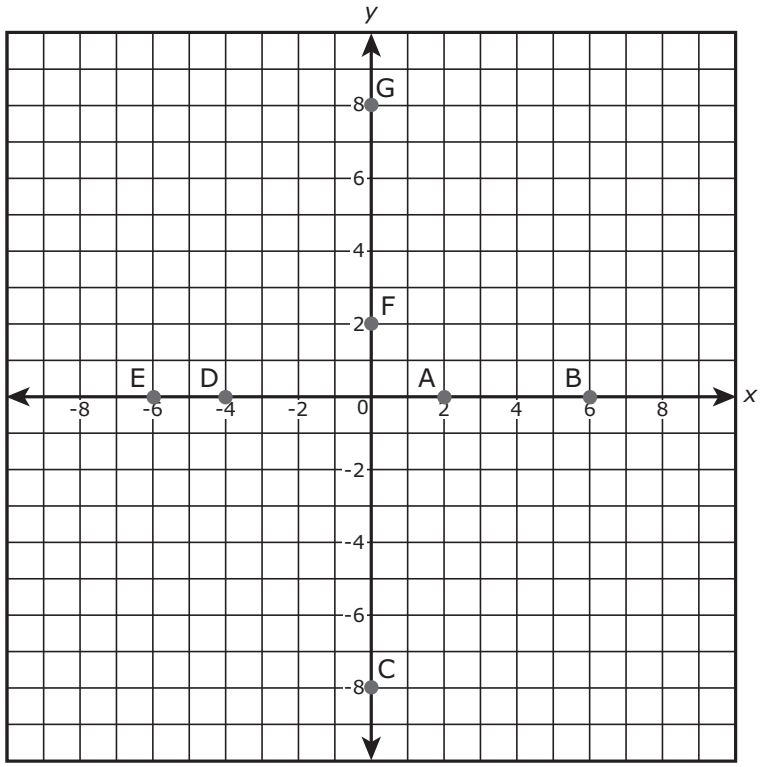


HINT: Multiple-select items will have five to eight answer options.

Fill in the response circles with one or more answer choices. You must fill in the correct number of circles for the item to be considered complete.

M41083P_1,2,5

3. Several points are plotted on the graph.



Which of the plotted points on the graph represent the zeros of the function $f(x) = (x^2 + 2x - 8)(x - 6)$? Select **all** that apply.

Ⓐ (2, 0)

Ⓑ (6, 0)

Ⓒ (0, −8)

Ⓓ (−4, 0)

Ⓔ (−6, 0)

Ⓕ (0, 2)

Ⓖ (0, 8)

GO ON ▶

VH100720_4:3,4,5

Use the information provided to answer Part A and Part B for question 4.

Consider the equation $(x^2 + 3)^2 + 21 = 10x^2 + 30$.

4. Part A

Let $u = x^2 + 3$. Which equation is equivalent to $(x^2 + 3)^2 + 21 = 10x^2 + 30$ in terms of u?

Ⓐ $u^2 + 10u + 51 = 0$

Ⓑ $u^2 - 10u + 51 = 0$

Ⓒ $u^2 + 10u + 21 = 0$

Ⓓ $u^2 - 10u + 21 = 0$

Part B

What are the solutions of the equation $(x^2 + 3)^2 + 21 = 10x^2 + 30$?

Select **all** that apply.

Ⓐ -4

Ⓑ -3

Ⓒ -2

Ⓓ 0

Ⓔ 2

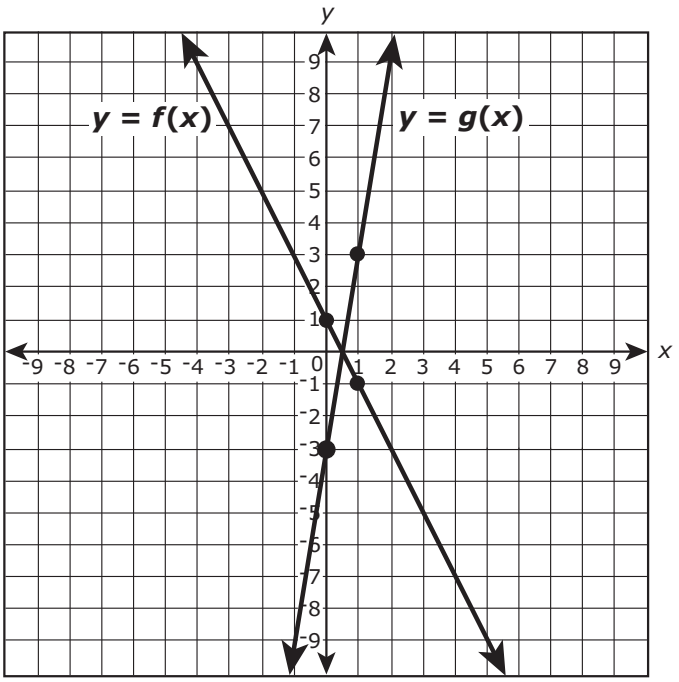
Ⓕ 3

Ⓖ 4

HINT: For gridded response items, your answer must be written and bubbled in the answer grid. To fill in a negative integer, fill in the circle with the negative sign in the first column of the answer grid. If a negative sign is not needed, do not fill in the bubble. Fraction bars cannot be entered into answer grids. Enter fractions as decimals. Please refer to page 4 of this tutorial, if necessary.

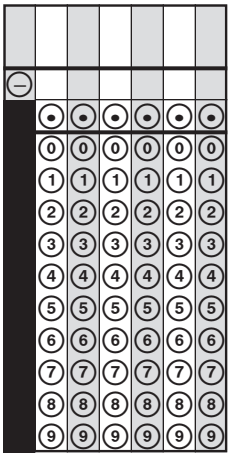
VH045903_-3

5. The figure shows the graphs of the functions $y = f(x)$ and $y = g(x)$. The four indicated points all have integer coordinates.



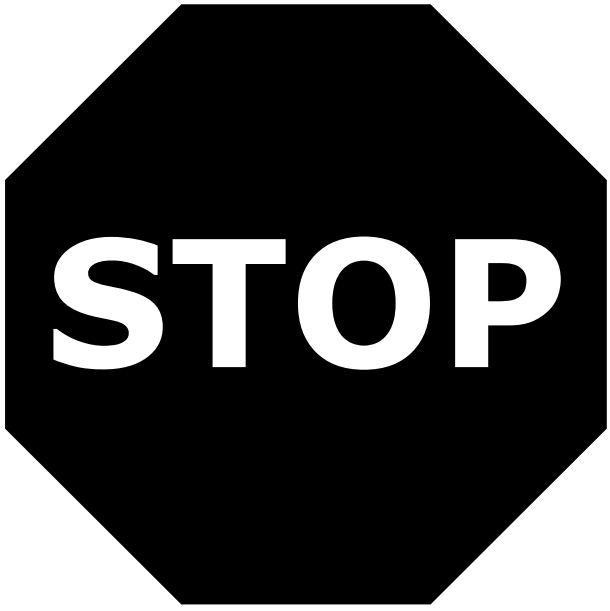
If $g(x) = k \cdot f(x)$, what is the value of k?

Enter your answer in the box.



STOP

HINT: During the actual test, you will see a stop sign at the end of each section. When you reach the stop sign, review the directions below it, and if there is time, review your answers from this section only. For the tutorial, ask your teacher if you have any questions about the directions below. You may go on to the next section.



You have come to the end of the non-calculator section in Unit 1 of the test.

- **If you have time, review your answers in the non-calculator section ONLY. You will not be allowed to return to the non-calculator section once you have received your calculator.**
- **Then, raise your hand to receive your calculator before going on to the calculator section.**

Unit 1 - Section 2 (Calculator)

The directions below will be used during the actual test. For the tutorial, please make sure you understand the directions, and ask your teacher if you have any questions. At the end of each section, go back and review any items you did not answer in that section only.

Once you have received your calculator, continue with the calculator section.

HINT: This is a multiple-select item with eight answer choices labeled A through H.

On multiple-select items the directions indicate multiple responses are required by the word 'all' in the last statement, "Select <u>all</u> that apply." Fill in the response circles on your test booklet with one or more answer choice.

VH119723_4,8

6. The expression $3x^2 - 33x - 180$ can be factored into the form $a(x + b)(x + c)$, where a, b, and c are constants, to reveal the zeros of the function defined by the expression. What are the zeros of the function defined by $3x^2 - 33x - 180$?

Select **all** that apply.

Ⓐ −15

Ⓑ −10

Ⓒ −6

Ⓓ −4

Ⓔ 4

Ⓕ 6

Ⓖ 10

Ⓗ 15

HINT: For gridded response items, your answer must be written and bubbled in the answer grid. Read the directions carefully.

When completing an answer grid, do not leave empty spaces between integers. Fill in the circles from left to right, as necessary.

VF649975_3

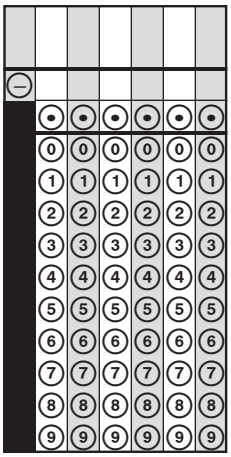
7.

$$y = x^2 - 2x - 5$$

$$y = x^3 - 2x^2 - 5x - 9$$

When the solutions to each of the two equations shown are graphed in the *xy*-coordinate plane, the graphs of the solutions intersect at a point. What is the *y*-coordinate of the point of intersection?

Enter your answer in the box.



HINT: This item has four parts. In your test booklet, there will be designated answer spaces that correspond with each part of the item. Parts A and C are answer grids, while parts B and D are multiple-choice.

VH095821_51600:1:53290:3

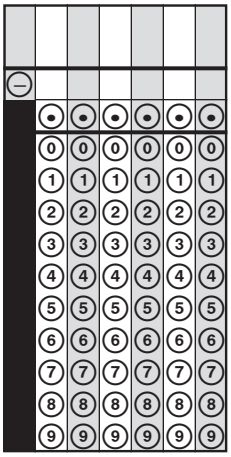
Use the information provided to answer Part A through Part D for question 8.

The population of a city in 2005 was 36,000. By 2010, the city's population had grown to 43,800 people.

8. Part A

Assuming that the population of the city has grown linearly since 2005 and continues to grow at the same rate, what will be the population in 2015?

Enter your answer in the box.



Part B

Which expression is an appropriate exponential model for the population of the city? Let t represent the time, in years, since 2005.

Ⓐ $36{,}000(1.04)^{t}$

Ⓑ $36{,}000(1.04)^{5t}$

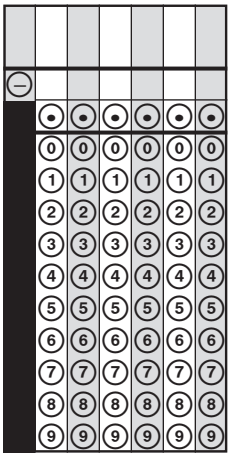
Ⓒ $36{,}000(1.217)^{t}$

Ⓓ $36{,}000(1.217)^{5t}$

Part C

Assuming that the population of the city has grown exponentially since 2005 and continues to grow at the same rate, what will be the population in 2015? Give your answer to the nearest whole number.

Enter your answer in the box.



Part D

Another town's population could be modeled by the function $P(t) = 27{,}400(1.66)^{\frac{t}{10}}$, where P represents the population and t represents the time, in years, since 2005. Based on the model, by approximately what percent does the population of this town increase each year?

Ⓐ 1

Ⓑ 3

Ⓒ 5

Ⓓ 7

HINT: This is an open-response item. This item type requires you to show your reasoning and modeling in solving the item. Although you may have scratch paper, only the work shown in the box in the test booklet will be scored. Include all work and justifications/explanations as required by the item to fully support your answer. Be sure to show your work and explain your answer with clear and concise language.

VH002628

9. A chemistry student is creating mixtures of diluted acid. Beaker 1 and Beaker 2 are completely filled with mixtures and Beaker 3 is empty. The student will pour the contents of Beaker 1 and Beaker 2 into Beaker 3. The table shows the volume of each beaker and the percent of acid contained in the mixtures for Beakers 1 and 2.

Beaker	Volume (ounces)	Percent of Acid
1	60	20%
2	10	45%
3	120	

After the contents of Beakers 1 and 2 have been poured into Beaker 3, a third mixture will be poured into Beaker 3 to fill it completely. What is the percent acid needed for the third mixture so that the resulting mixture in Beaker 3 will contain 30% acid?

Show your work and explain your answer.

Enter your answer and your explanation in the space provided.

HINT: This is a graphing item. You will use the coordinate plane in your test booklet to respond to the item. Be sure to draw the line clearly in your test booklet.

VH005322

Use the information provided to answer Part A through Part C for question 10.

The owner of a new movie theater collected attendance data for five of the seven days of the first week the theater was open.

Day of the Week	Tickets Sold
Monday	350
Tuesday	
Wednesday	275
Thursday	288
Friday	1,634
Saturday	
Sunday	1,511

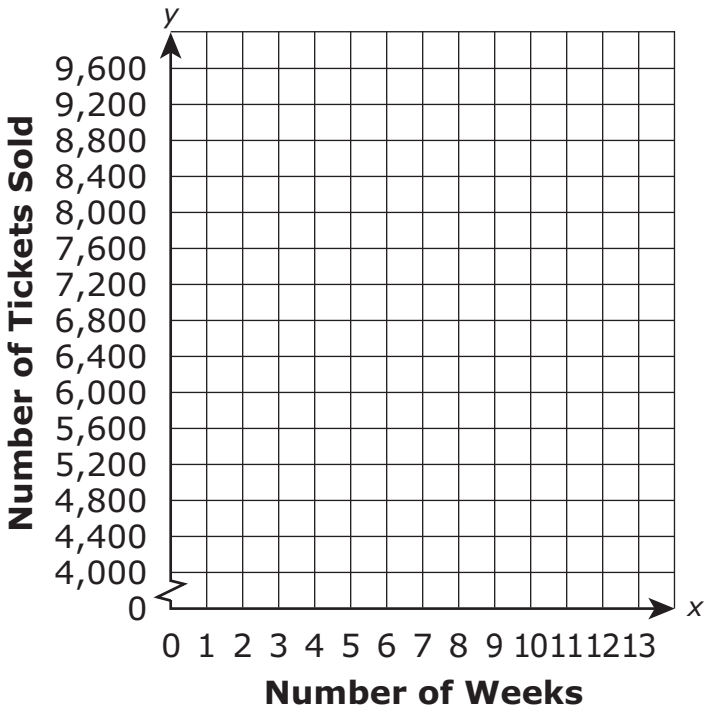
10. Part A

Provide an estimate for the total attendance for the first week. Justify the reasoning behind your estimate.

Enter your answer and your justification in the space provided.

Part B

Based on past data, new theater ticket sales after the first week are predicted to increase by 800 tickets every 4 weeks, for 3 months (approximately 13 weeks). Using your estimate from Part A, graph a line that can be used to predict the number of tickets sold as a function of the number of weeks the theater has been open.



GO ON ▶

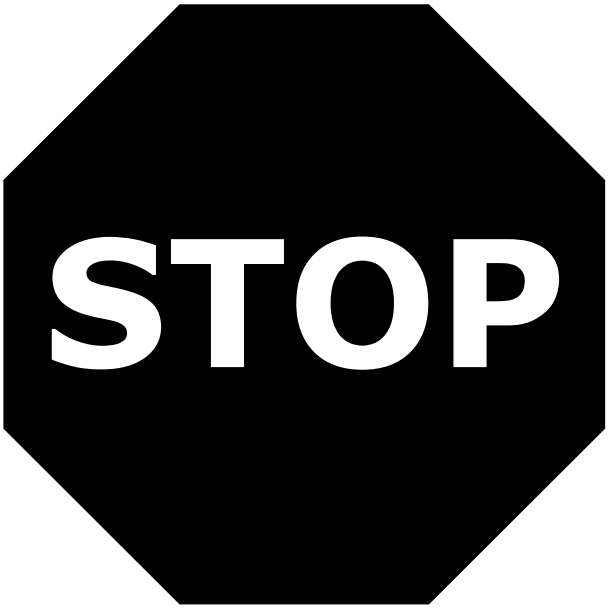
Part C

Explain how you can use your graph to predict the number of tickets that will be sold in the 13th week after the theater opened.

Enter your explanation in the space provided.

STOP

HINT: During the actual test, you will see a stop sign at the end of each section. When you reach the stop sign, review the directions below it, and if there is time, review your answers from this section only. For the tutorial, ask your teacher if you have any questions about the directions below.



You have come to the end of the calculator section in Unit 1 of the test.

- **Review your answers in the calculator section of Unit 1 only.**
- **Then, close your test booklet and raise your hand to turn in your test materials.**

STOP