Student Name _____

PARCC

Partnership for Assessment of
Readiness for College and Careers

High School Mathematics Test Booklet

Student Tutorial

DO NOT PLACE STUDENT ID LABEL HERE

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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 Administrations. 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 more than one answer. Mark your answers by filling in the circles in your answer document.

Do not make any stray marks in the answer document. If you need to change an answer in your answer document, 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.

GO ON ▶

Directions for answering multiple-choice and multiple-select items:

Mark your answers by filling in the circles in your answer document. Do not make any stray marks in the answer document. If you need to change an answer, be sure to erase your first answer completely.

To answer a question that asks you to pick one answer, fill in the circle as follows:

Ⓐ●ⒸⒹⒺⒻⒼⒽ

To answer a question that asks you to pick more than one answer, fill in the circles as follows:

Ⓐ●Ⓒ●●ⒻⒼⒽ

Some questions may have more response circles available than answer choices. Read the question carefully and follow the directions to respond with the appropriate number of answers. Below are examples of response options and response circles.

Response Options

A. $5 + 2 = 7$

B. $9 + 3 = 15$

C. $16 - 2 = 3$

D. $1 + 1 = 10$

Response Circles

ⒶⒷⒸⒹⒺⒻⒼⒽ

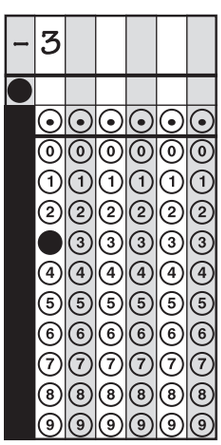
Practice filling in the circles on the corresponding answer document.

GO ON ▶

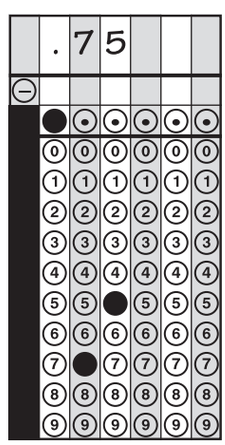
Directions for Completing the Answer Grids

1. Work the problem 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 answer −3 in a question, fill in the answer grid as follows:



To answer .75 in a question, fill in the answer grid as follows:



Practice filling in the circles with the corresponding answer document.

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.

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 test 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.

GO ON ▶

HINT: This is a multiple-choice item with four answer options. The directions indicate only one answer is required by the use of "the" in the statement, Select the correct equation. Fill in the bubble on your answer document with one choice.

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.

A. $C(4) = 99.50$

B. $C(398) = 4$

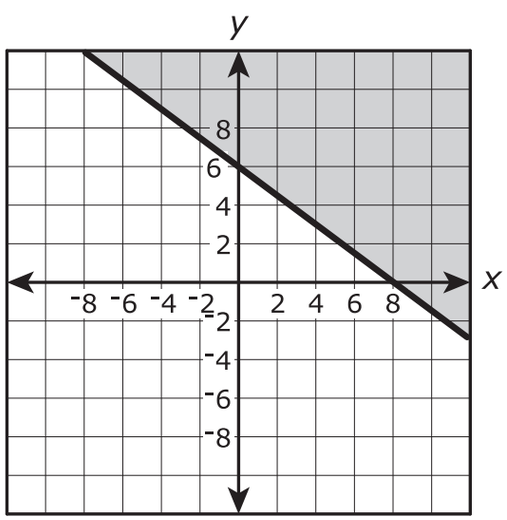
C. $C(4) = 398$

D. $C(99.50) = 1$

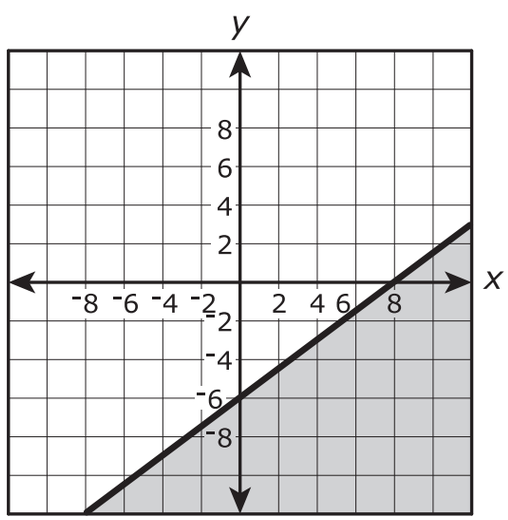
HINT: On this multiple-choice item, the directions indicate only one answer is required by the use of 'a' in the question, "Which is a graph of the solution set of the inequality . . . ." Fill in the bubble on your answer document with one choice.

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

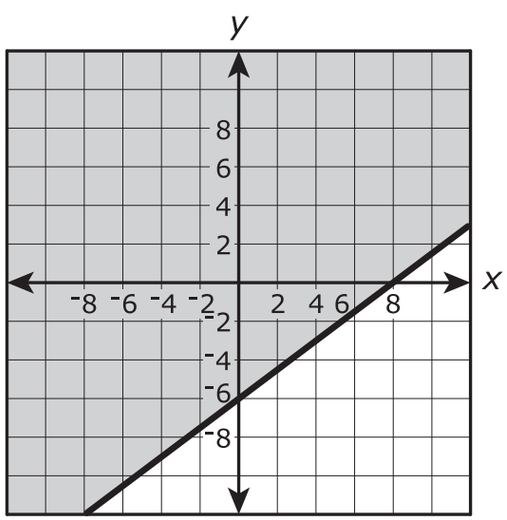
A.



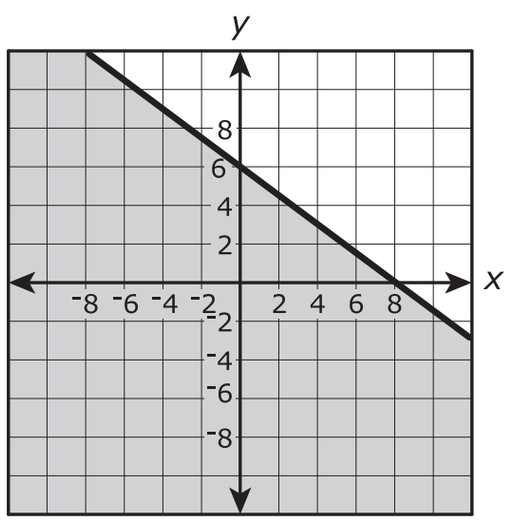
B.



C.



D.

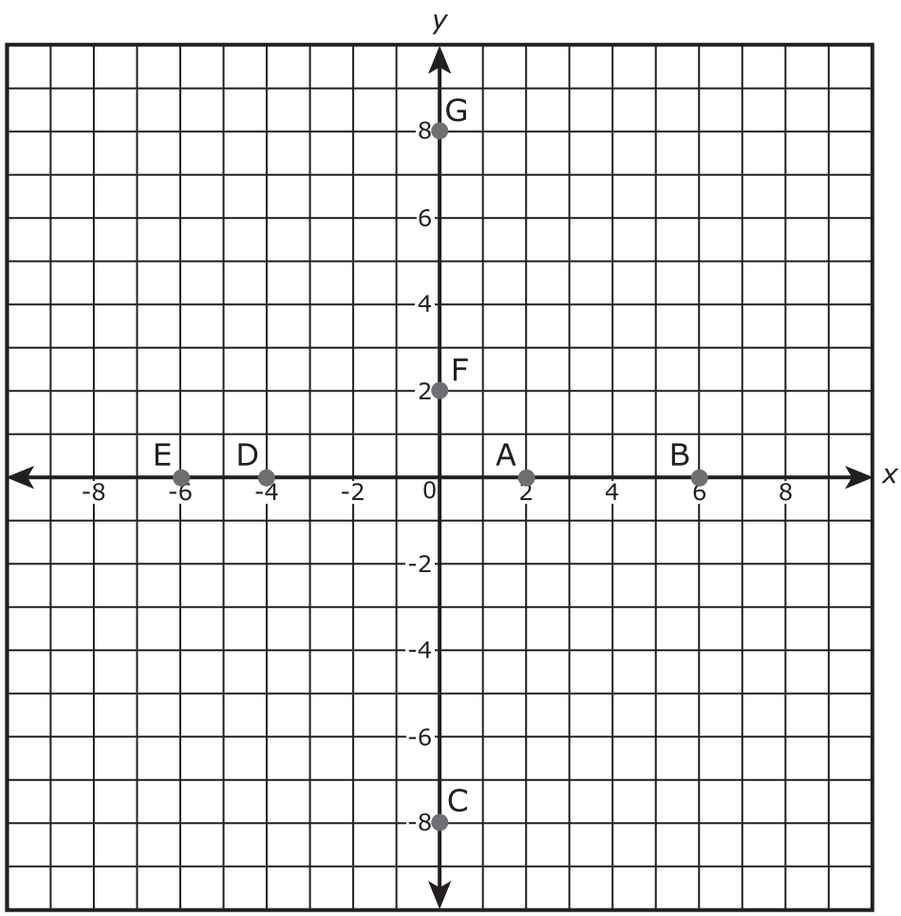


GO ON ▶

HINT: This is a multiple-select item with seven answer options. The options are lettered A through G. On your answer document the response circles are labeled A through H.

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

3. Several points are plotted on the graph.



GO ON ▶

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.

A. (2, 0)

B. (6, 0)

C. (0, −8)

D. (−4, 0)

E. (−6, 0)

F. (0, 2)

G. (0, 8)

HINT: This item has two parts to it. On this example, Part A is a multiple-choice item. The directions indicate only one answer is required by the use of 'which' in the question, "Which equation is equivalent . . . ." Fill in the response circle on your answer document with one choice.

Part B is a multiple-select item. The directions indicate multiple answers are required by the word 'all' in the last statement, "Select <u>all</u> that apply." Fill in the response circles in your answer document with one or more answer choice.

In your answer document, response circles are labeled A through H on both Part A and Part B. Part B will be highlighted in gray in your answer document.

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?

A. $u^2 + 10u + 51 = 0$

B. $u^2 - 10u + 51 = 0$

C. $u^2 + 10u + 21 = 0$

D. $u^2 - 10u + 21 = 0$

GO ON ▶

Part B

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

Select **all** that apply.

A. -4

B. -3

C. -2

D. 0

E. 2

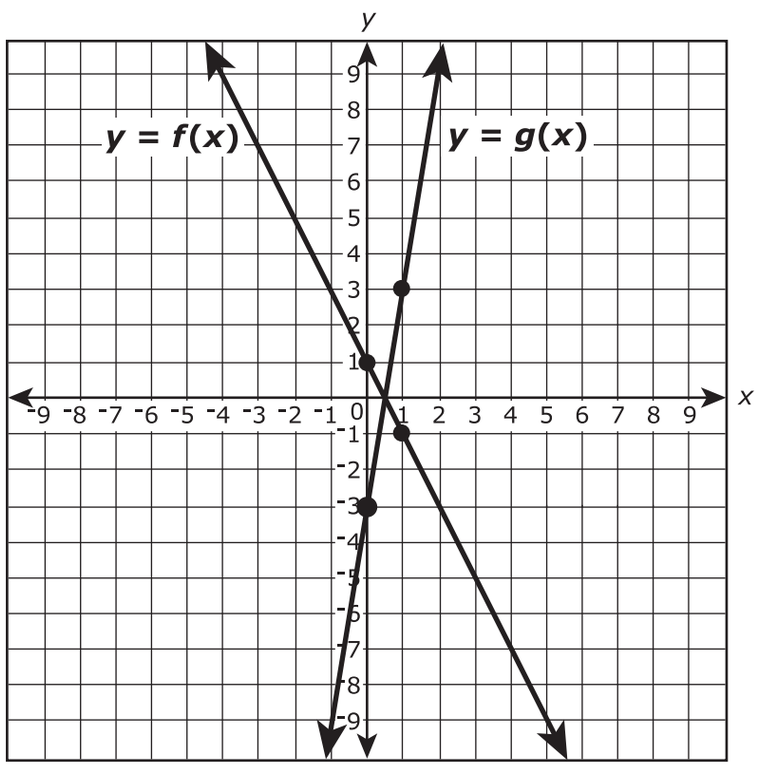
F. 3

G. 4

GO ON ▶

HINT: Your answer must be written and bubbled in the answer grid. To fill in a negative integer, fill in the circle above the negative sign in the first column of the answer grid. If a negative sign is not needed, do not fill in the bubble. Please refer to page 3 of this tutorial, if necessary.

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.

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

GO ON ▶

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 answer document with more than one answer choice.

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.

A. −15

B. −10

C. −6

D. −4

E. 4

F. 6

G. 10

H. 15

GO ON ▶

HINT: Your answer must be written and bubbled in the answer grid. Read the directions carefully. This item is asking for only the *y*-coordinate of the ordered pair, not both coordinates.

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

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.

GO ON ▶

HINT: This item has four parts. In your answer document, 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.

Pay close attention to Part C. The question is asking you to round your answer to the nearest whole number even though a decimal can be filled in on all answer grids. If you do not round your answer as instructed in the item, your answer will not be counted as correct.

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.

A. $36{,}000(1.04)^{t}$

B. $36{,}000(1.04)^{5t}$

C. $36{,}000(1.217)^{t}$

D. $36{,}000(1.217)^{5t}$

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?

A. 1

B. 3

C. 5

D. 7

GO ON ▶

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 answer document will be scored. Be sure to 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.

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 graph in your answer document to respond to the item. Be sure to draw the line clearly in your answer document.

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.

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.

GO ON ▶

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 answer document and raise your hand to turn in your test materials.**

STOP