

#3

ALGEBRA I (COMMON CORE)

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

ALGEBRA I (Common Core)

Tuesday, June 3, 2014 — 9:15 a.m. to 12:15 p.m., only

Student Name: _____

SOLUTIONS

School Name: _____

The possession or use of any communications device is strictly prohibited when taking this examination. If you have or use any communications device, no matter how briefly, your examination will be invalidated and no score will be calculated for you.

Print your name and the name of your school on the lines above.

A separate answer sheet for Part I has been provided to you. Follow the instructions from the proctor for completing the student information on your answer sheet.

This examination has four parts, with a total of 37 questions. You must answer all questions in this examination. Record your answers to the Part I multiple-choice questions on the separate answer sheet. Write your answers to the questions in Parts II, III, and IV directly in this booklet. All work should be written in pen, except graphs and drawings, which should be done in pencil. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. The formulas that you may need to answer some questions in this examination are found at the end of the examination. This sheet is perforated so you may remove it from this booklet.

Scrap paper is not permitted for any part of this examination, but you may use the blank spaces in this booklet as scrap paper. A perforated sheet of scrap graph paper is provided at the end of this booklet for any question for which graphing may be helpful but is not required. You may remove this sheet from this booklet. Any work done on this sheet of scrap graph paper will *not* be scored.

When you have completed the examination, you must sign the statement printed at the end of the answer sheet, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during the examination. Your answer sheet cannot be accepted if you fail to sign this declaration.

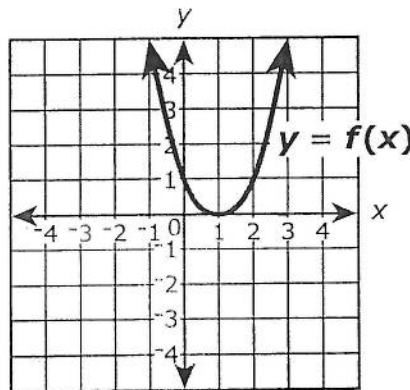
Notice...
A graphing calculator and a straightedge (ruler) must be available for you to use while taking this examination.

DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.



Use the information provided to answer Part A through Part D for question 29.

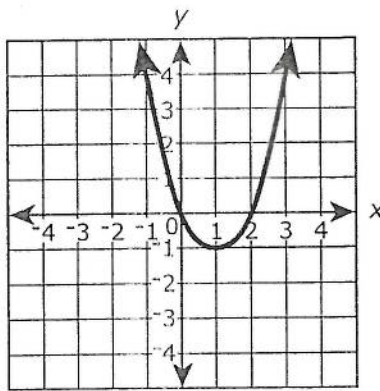
Consider the function $f(x)$, shown in the xy -coordinate plane, as the parent function.



** the original is right 1*

29. Part A

The graph of a transformation of the function $f(x)$ is shown.



from original, it moved down 1

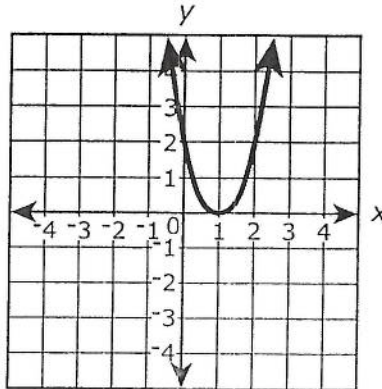
Which expression defines the transformation shown?

- $f(x + 0) - 1$
- $f(x + 0) + 1$
- $f(x - 1) + 0$
- $f(x + 1) + 0$



Part B

The graph of a transformation of the function $f(x)$ is shown.



*from original,
it is narrow*

Which expression defines the transformation shown?

Ⓐ $\frac{1}{2}f(x + 0) + 0$

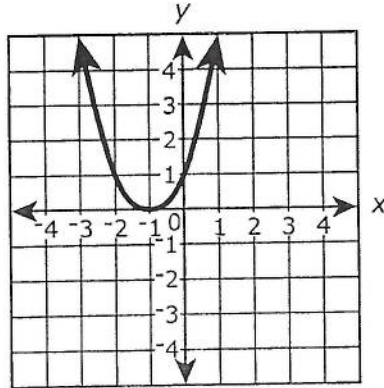
Ⓑ $2f(x + 0) + 0$

Ⓒ $\frac{1}{2}f(x - 1) - 1$

Ⓓ $2f(x + 1) - 0$

**Part C**

The graph of a transformation of the function $f(x)$ is shown.



*from original,
left 2*

Which expression defines the transformation shown?

- Ⓐ $f(x) - 2$
- Ⓑ $f(x - 2) + 0$
- Ⓒ $f(x) + 2$
- Ⓓ $f(x + 2) + 0$



Use the information provided to answer Part A through Part D for question 33.

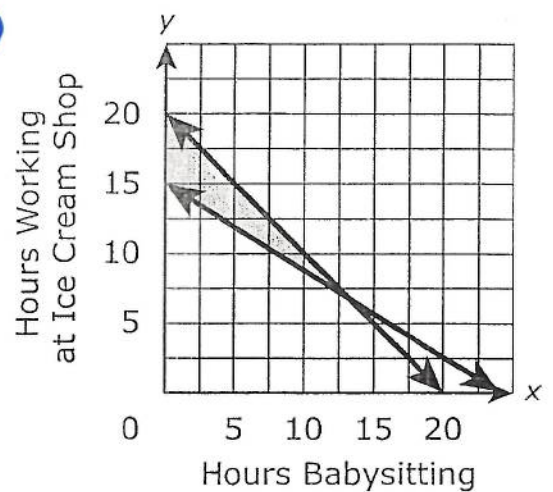
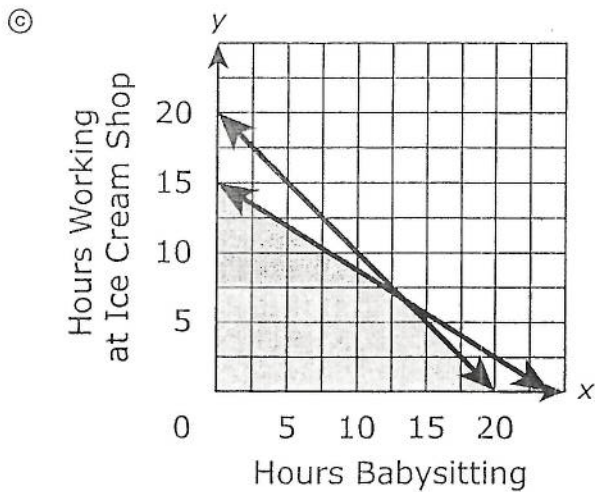
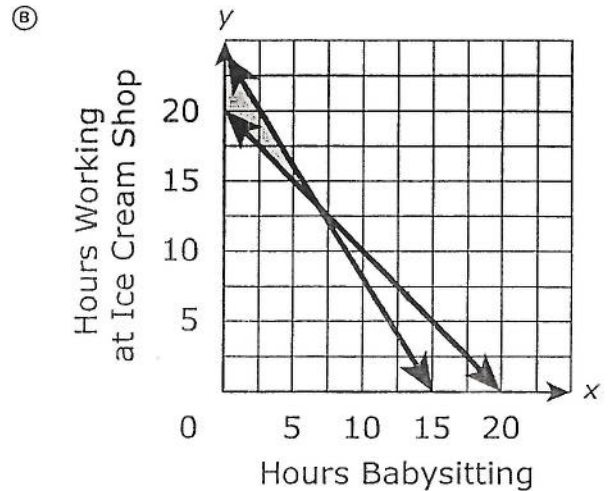
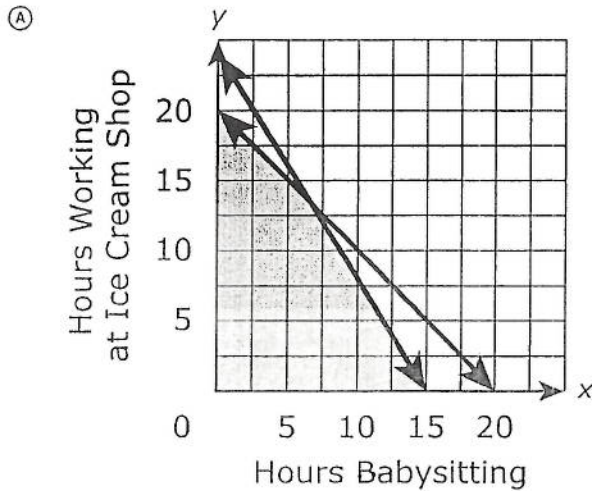
Leah would like to earn at least \$120 per month. She babysits for \$5 per hour and works at an ice cream shop for \$8 per hour. Leah cannot work more than a total of 20 hours per month. Let x represent the number of hours Leah babysits and let y represent the number of hours Leah works at the ice cream shop.

$$5x + 8y \geq 120 \rightarrow y \geq -\frac{5}{8}x + 15$$

$$x + y \leq 20 \rightarrow y \leq -x + 20$$

33. Part A

Which graph shows the set of points that represents the number of hours that Leah can work in order to earn at least \$120 and not work more than 20 hours per month?





Part B

Which pairs (x, y) represent hours that Leah could work to meet the given conditions?

Select **all** that apply.

- (A) (4, 15)
- (B) (5, 12)
- (C) (10, 9)
- (D) (15, 5)
- (E) (19, 1)

Choose from shaded region in D

Part C

If Leah babysits for 7 hours this month, what is the minimum number of hours she would have to work at the ice cream shop to earn at least \$120?

Give your answer to the nearest whole hour.

Enter your answer in the box.

⊖						
•	•	•	•	•	•	•
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

$$5(7) + 8y \geq 120$$

$$y \geq 10.6$$

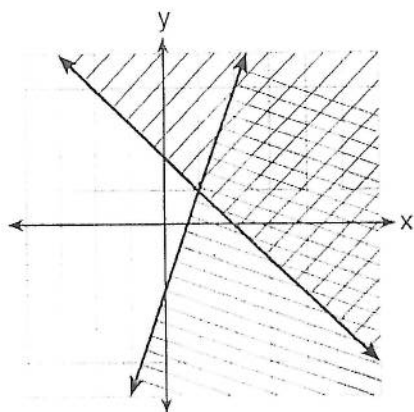
10 hours

Use this space for computations.

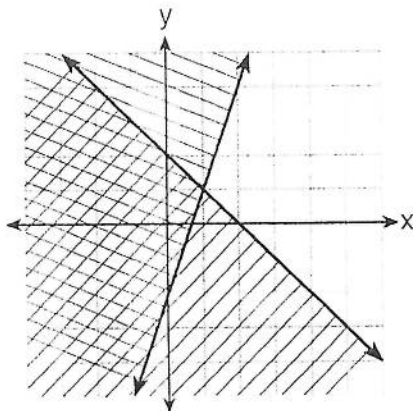
4 Given: $y + x > 2$
 $y \leq 3x - 2$

$y > -x + 2$

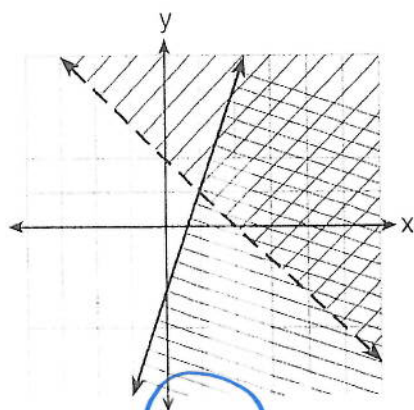
Which graph shows the solution of the given set of inequalities?



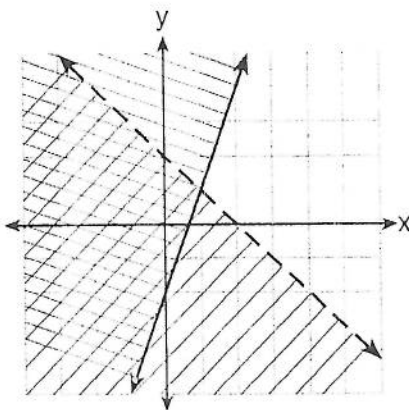
(1)



(3)



(2)



(4)

mult across fractions

5 Which value of x satisfies the equation $\frac{7}{3}\left(x + \frac{9}{28}\right) = 20$?

(1) 8.25

(2) 8.89

(3) 19.25

(4) 44.92

$\frac{7}{3}x + \frac{63}{84} = 20$

$\frac{7}{3}x = 19.25$

Use this space for computations.

6 The table below shows the average yearly balance in a savings account where interest is compounded annually. No money is deposited or withdrawn after the initial amount is deposited.

Year	Balance, in Dollars
0	380.00
10	562.49
20	832.63
30	1232.49
40	1824.39
50	2700.54

$$\frac{832.63 - 562.49}{10}$$

$$\frac{2700.54 - 1824.39}{10}$$

not a constant slope.

Which type of function best models the given data?

- (1) linear function with a negative rate of change
- (2) linear function with a positive rate of change
- (3) exponential decay function
- (4) exponential growth function

7 A company that manufactures radios first pays a start-up cost, and then spends a certain amount of money to manufacture each radio. If the cost of manufacturing r radios is given by the function $c(r) = 5.25r + 125$, then the value 5.25 best represents

- (1) the start-up cost
- (2) the profit earned from the sale of one radio
- (3) the amount spent to manufacture each radio
- (4) the average number of radios manufactured

8 Which equation has the same solution as $x^2 - 6x - 12 = 0$?

(1) $(x + 3)^2 = 21$

(3) $(x + 3)^2 = 3$

(2) $(x - 3)^2 = 21$

(4) $(x - 3)^2 = 3$

$$x^2 - 6x = 12$$

$$x(x - 6) = 12$$

~~complete the square.~~
 ~~$(\frac{-b}{2})^2$~~

$$(x+3)(x+3) = x^2 + 6x + 9$$

$$(x-3)(x-3) = x^2 - 6x + 9$$



FOIL these out to Compare!

Use this space for computations.

14 Which system of equations has the same solution as the system below?

$$\begin{aligned}2x + 2y &= 16 \\ 3x - y &= 4\end{aligned}$$

~~(1)~~ $\begin{aligned}2x + 2y &= 16 \\ 6x - 2y &= 4\end{aligned}$

(3) $\begin{aligned}x + y &= 16 \\ 3x - y &= 4\end{aligned}$

(2) $\begin{aligned}2x + 2y &= 16 \\ 6x - 2y &= 8\end{aligned}$

(4) $\begin{aligned}6x + 6y &= 48 \\ 6x + 2y &= 8\end{aligned}$

↓
mult bottom by 2

15 The table below represents the function F .

x	3	4	6	7	8
$F(x)$	9	17	65	129	257

The equation that represents this function is

(1) $F(x) = 3^x$

(2) $F(x) = 2^x + 1$

(2) $F(x) = 3x$

~~(4)~~ $F(x) = 2x + 3$

16 John has four more nickels than dimes in his pocket, for a total of \$1.25. Which equation could be used to determine the number of dimes, x , in his pocket?

(1) $0.10(x + 4) + 0.05(x) = \1.25

(2) $0.05(x + 4) + 0.10(x) = \1.25

(3) $0.10(4x) + 0.05(x) = \$1.25$

(4) $0.05(4x) + 0.10(x) = \$1.25$

17 If $f(x) = \frac{1}{3}x + 9$, which statement is always true?

(1) $f(x) < 0$

(3) If $x < 0$, then $f(x) < 0$.

(2) $f(x) > 0$

(4) If $x > 0$, then $f(x) > 0$.

