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Our Students. Their Moment.

**Regents Examination in  
Algebra I (Common Core)**

**Sample Questions  
Fall 2013**

1 Which ordered pair is *not* in the solution set of  $y > -\frac{1}{2}x + 5$  and  $y \leq 3x - 2$ ?

(1) (5,3)

(2) (4,3)

(3) (3,4)

(4) (4,4)

2 If the quadratic formula is used to find the roots of the equation  $x^2 - 6x - 19 = 0$ , the correct roots are

(1)  $3 \pm 2\sqrt{7}$

(3)  $3 \pm 4\sqrt{14}$

(2)  $-3 \pm 2\sqrt{7}$

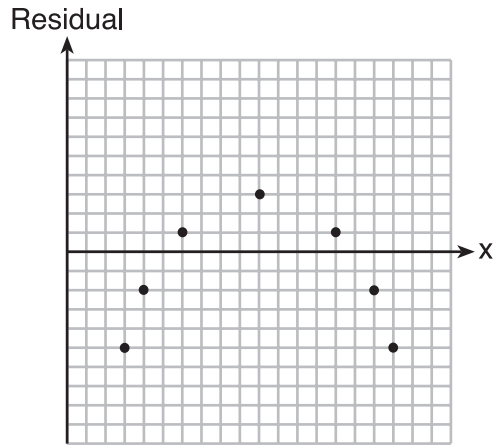
(4)  $-3 \pm 4\sqrt{14}$

3 Which statistic would indicate that a linear function would *not* be a good fit to model a data set?

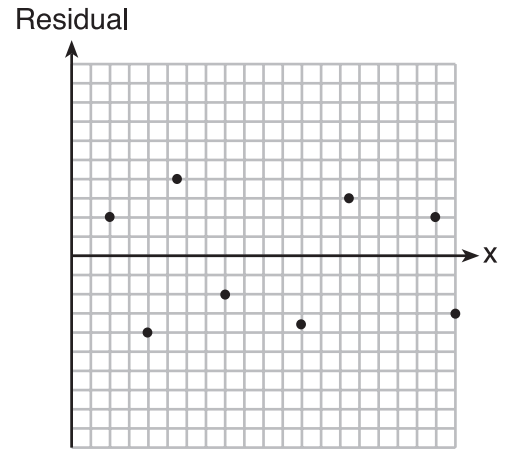
(1)  $r = -0.93$

(2)  $r = 1$

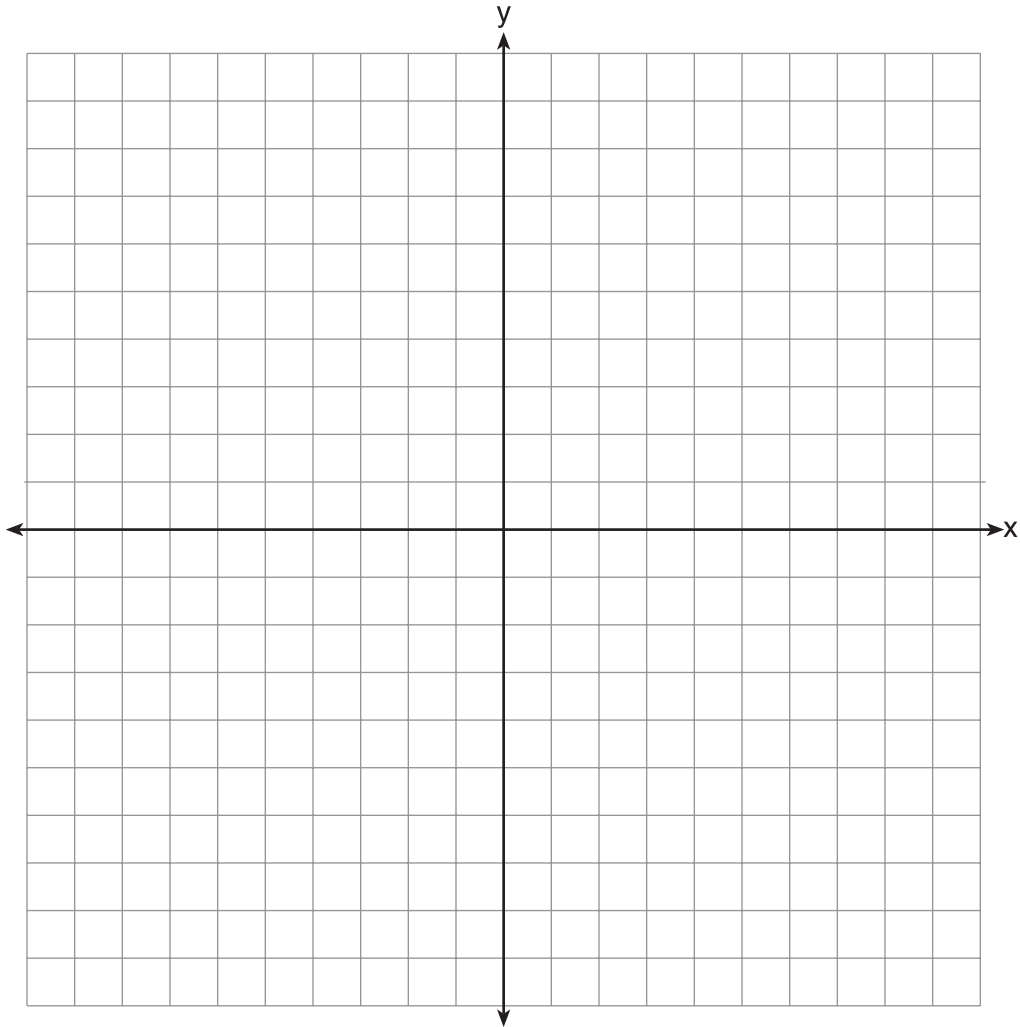
(3)



(4)

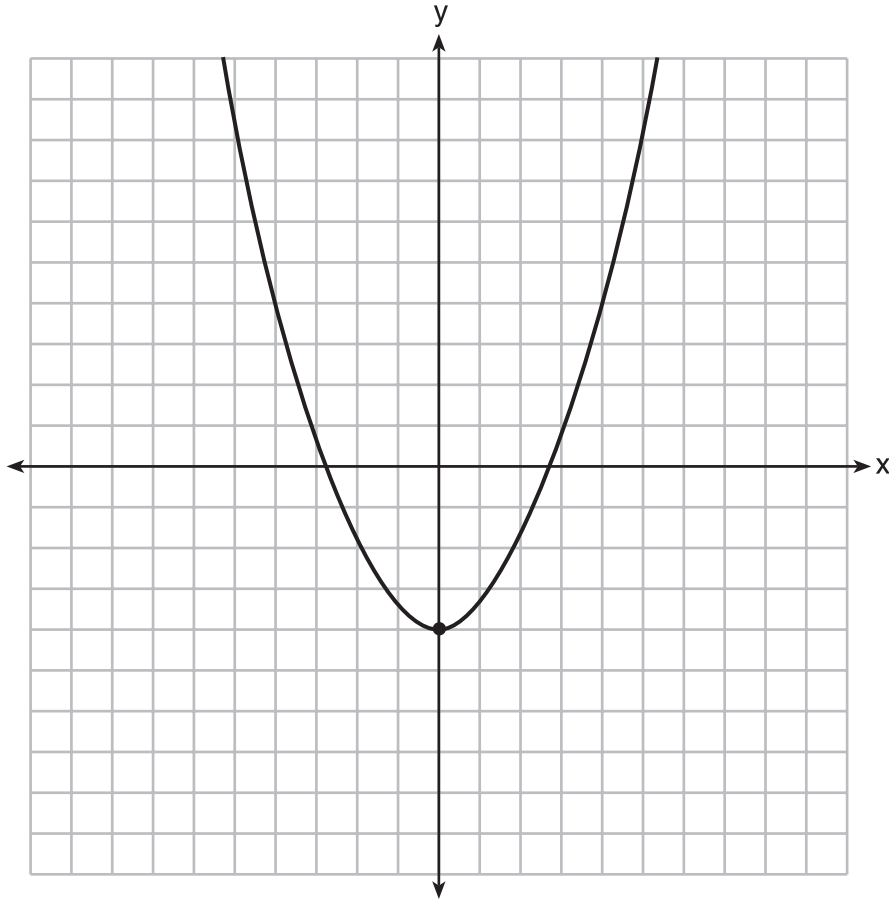


- 4 On the set of axes below, graph the function represented by  $y = \sqrt[3]{x-2}$  for the domain  $-6 \leq x \leq 10$ .



5 Solve  $8m^2 + 20m = 12$  for  $m$  by factoring.

- 6 Ryker is given the graph of the function  $y = \frac{1}{2}x^2 - 4$ . He wants to find the zeros of the function, but is unable to read them exactly from the graph.



Find the zeros in simplest radical form.

- 7 Emma recently purchased a new car. She decided to keep track of how many gallons of gas she used on five of her business trips. The results are shown in the table below.

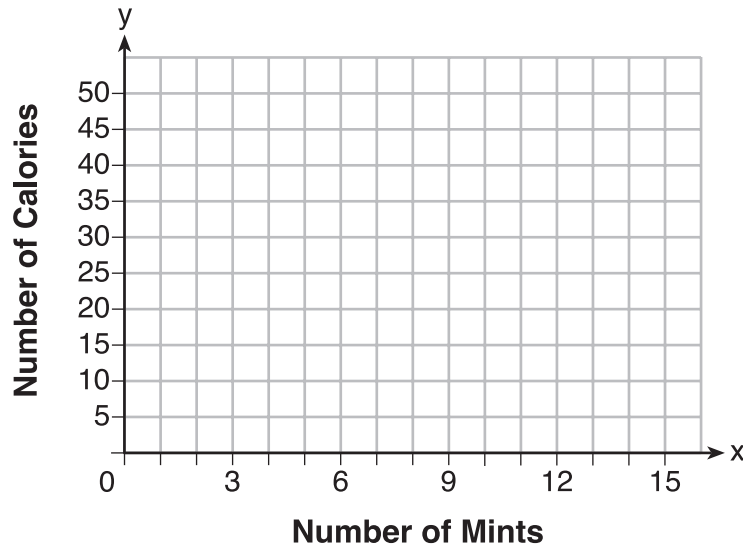
<b>Miles Driven</b>	<b>Number of Gallons Used</b>
150	7
200	10
400	19
600	29
1000	51

Write the linear regression equation for these data where miles driven is the independent variable. (Round all values to the *nearest hundredth*.)



- 8 Max purchased a box of green tea mints. The nutrition label on the box stated that a serving of three mints contains a total of 10 Calories.

On the axes below, graph the function,  $C$ , where  $C(x)$  represents the number of Calories in  $x$  mints.



Write an equation that represents  $C(x)$ .

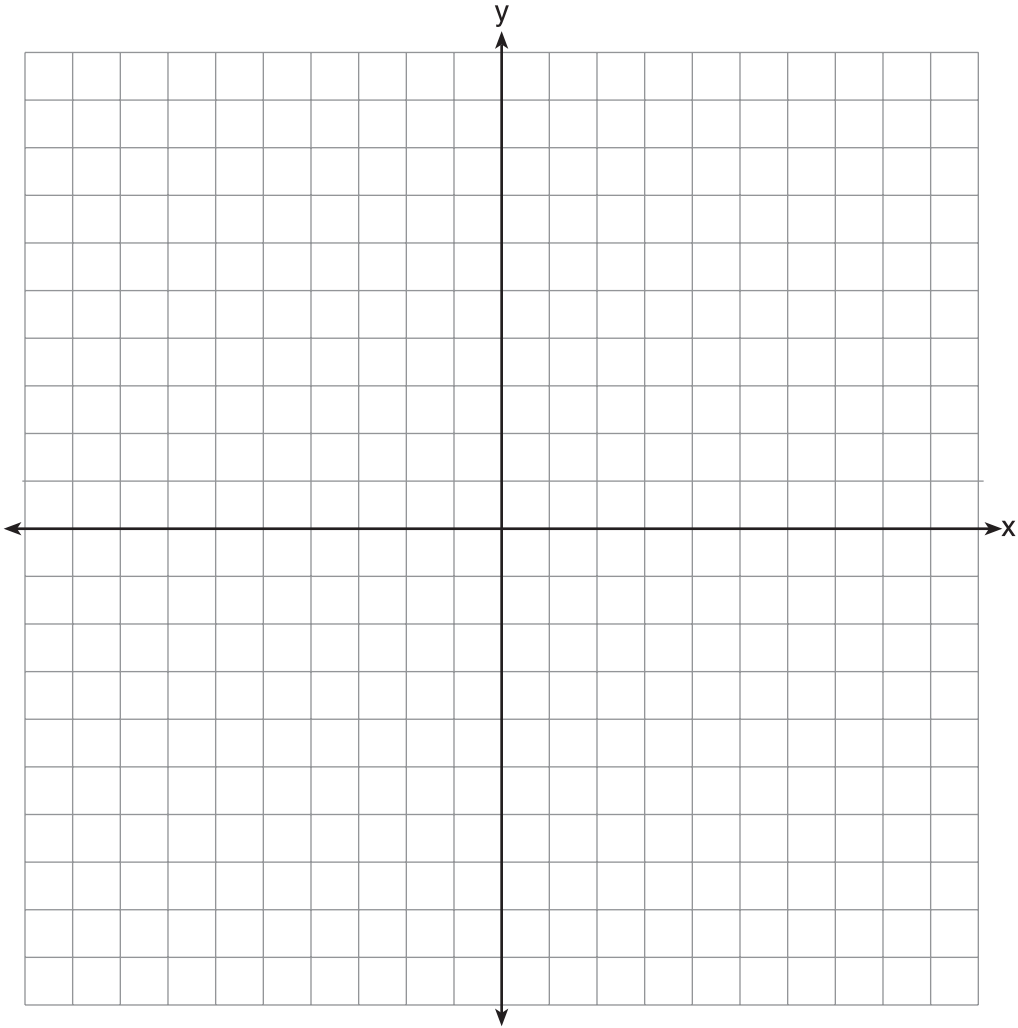
A full box of mints contains 180 Calories. Use the equation to determine the total number of mints in the box.

- 9 David has two jobs. He earns \$8 per hour babysitting his neighbor's children and he earns \$11 per hour working at the coffee shop.

Write an inequality to represent the number of hours,  $x$ , babysitting and the number of hours,  $y$ , working at the coffee shop that David will need to work to earn a minimum of \$200.

David worked 15 hours at the coffee shop. Use the inequality to find the number of full hours he must babysit to reach his goal of \$200.

- 10 On the set of axes below, graph the function  $y = |x + 1|$ .



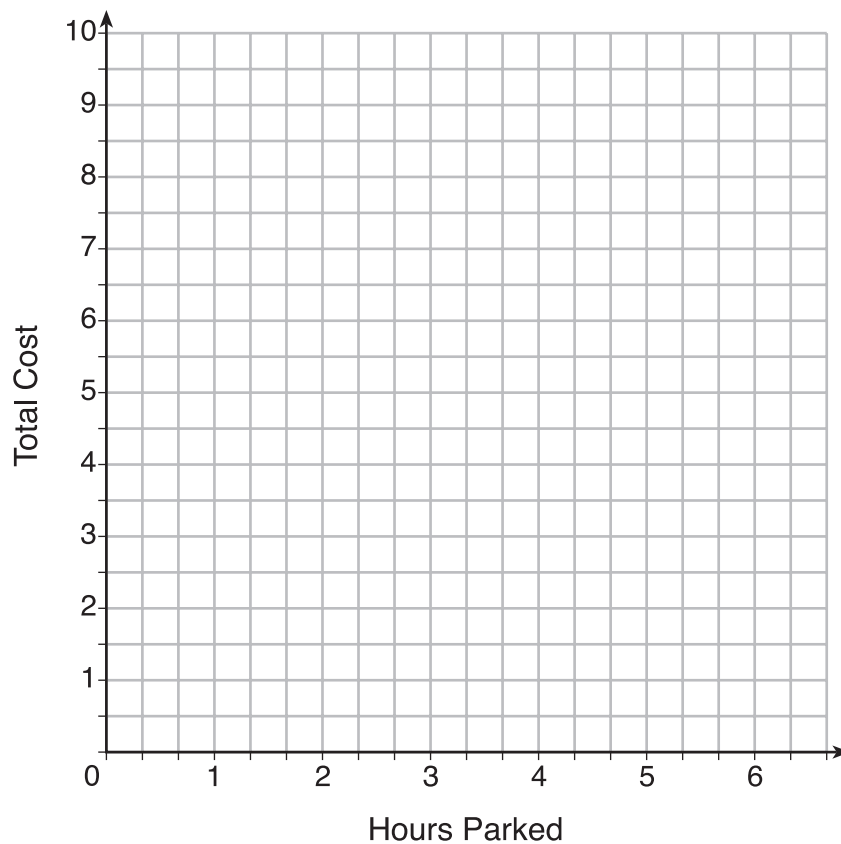
State the range of the function.

State the domain over which the function is increasing.

- 11 The table below lists the total cost for parking for a period of time on a street in Albany, N.Y. The total cost is for any length of time up to and including the hours parked. For example, parking for up to and including 1 hour would cost \$1.25; parking for 3.5 hours would cost \$5.75.

Hours Parked	Total Cost
1	1.25
2	2.50
3	4.00
4	5.75
5	7.75
6	10.00

Graph the step function that represents the cost for the number of hours parked.



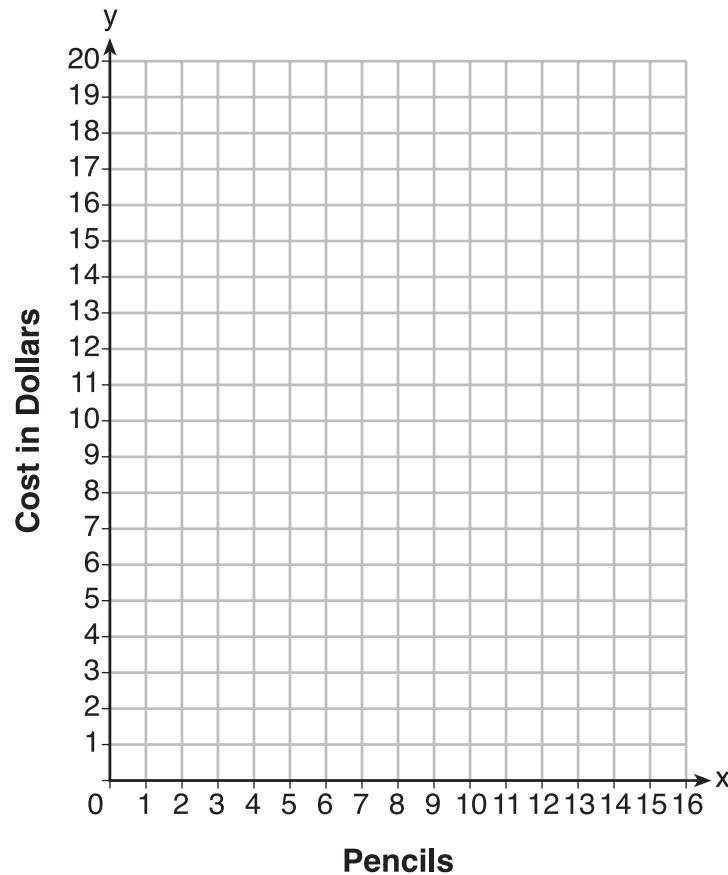
Explain how the cost per hour to park changes over the six-hour period.

- 12** At an office supply store, if a customer purchases fewer than 10 pencils, the cost of each pencil is \$1.75. If a customer purchases 10 or more pencils, the cost of each pencil is \$1.25.

Let  $c$  be a function for which  $c(x)$  is the cost of purchasing  $x$  pencils, where  $x$  is a whole number.

$$c(x) = \begin{cases} 1.75x, & \text{if } 0 \leq x \leq 9 \\ 1.25x, & \text{if } x \geq 10 \end{cases}$$

Create a graph of  $c$  on the axes below.



A customer brings 8 pencils to the cashier. The cashier suggests that the total cost to purchase 10 pencils would be less expensive. State whether the cashier is correct or incorrect. Justify your answer.

- 13 About a year ago, Joey watched an online video of a band and noticed that it had been viewed only 843 times. One month later, Joey noticed that the band's video had 1708 views. Joey made the table below to keep track of the cumulative number of views the video was getting online.

Months Since First Viewing	Total Views
0	843
1	1708
2	forgot to record
3	7124
4	14,684
5	29,787
6	62,381

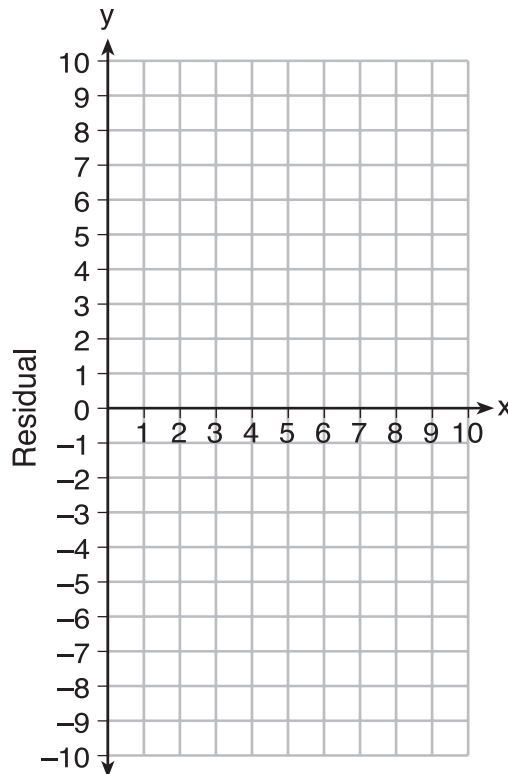
- a) Write a regression equation that best models these data. Round all values to the *nearest hundredth*. Justify your choice of regression equation.
- b) As shown in the table, Joey forgot to record the number of views after the second month. Use the equation from part *a* to estimate the number of full views of the online video that Joey forgot to record.

- 14 Use the data below to write the regression equation ( $y = ax + b$ ) for the raw test score based on the hours tutored. Round all values to the *nearest hundredth*.

Tutor Hours, $x$	Raw Test Score	Residual (Actual – Predicted)
1	30	1.3
2	37	1.9
3	35	-6.4
4	47	-0.7
5	56	2.0
6	67	6.6
7	62	-4.7

Equation: \_\_\_\_\_

Create a residual plot on the axes below, using the residual scores in the table above.



Based on the residual plot, state whether the equation is a good fit for the data. Justify your answer.

- 15** A local business was looking to hire a landscaper to work on their property. They narrowed their choices to two companies. Flourish Landscaping Company charges a flat rate of \$120 per hour. Green Thumb Landscapers charges \$70 per hour plus a \$1600 equipment fee.

Write a system of equations representing how much each company charges.

Determine and state the number of hours that must be worked for the cost of each company to be the same. [The use of the grid below is optional.]

If it is estimated to take at least 35 hours to complete the job, which company will be less expensive? Justify your answer.

