TEST NAME: **Math Algebra 1 FAIM 2016 Form 2-A**
TEST ID: **549495**
GRADE: **Ninth Grade - Twelfth Grade**
SUBJECT: **Mathematics**
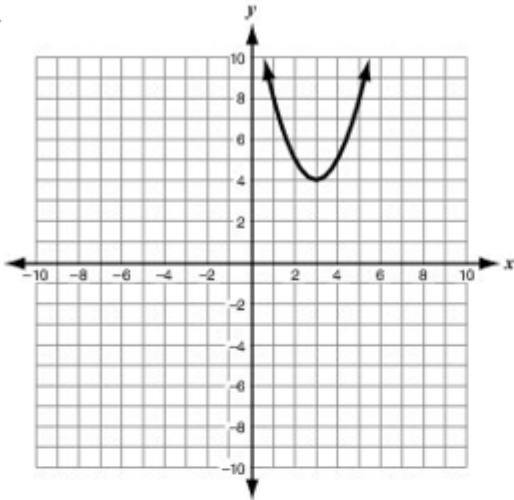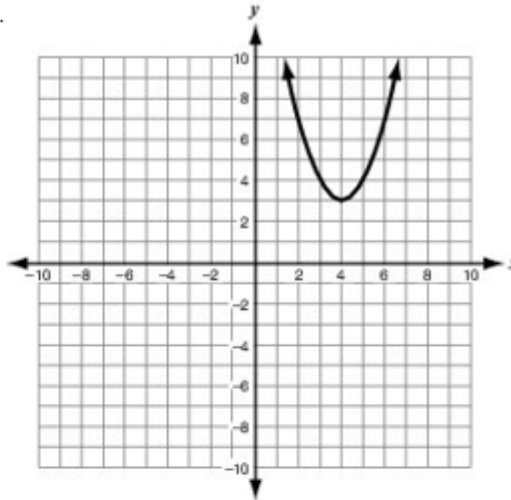TEST CATEGORY: **State Interim Assessment**

Student:

Class:

Date:

1. Which of these graphs has its maximum point on the line $x = 3$?
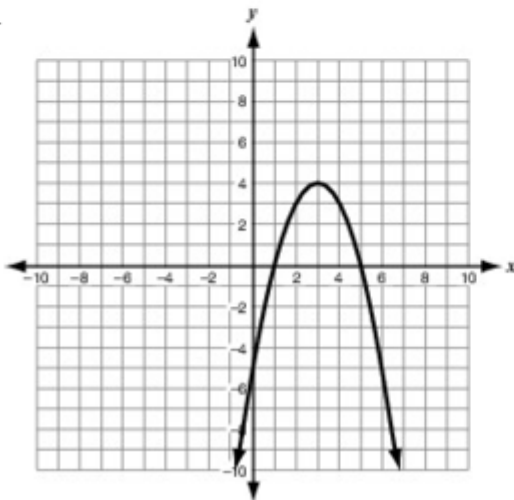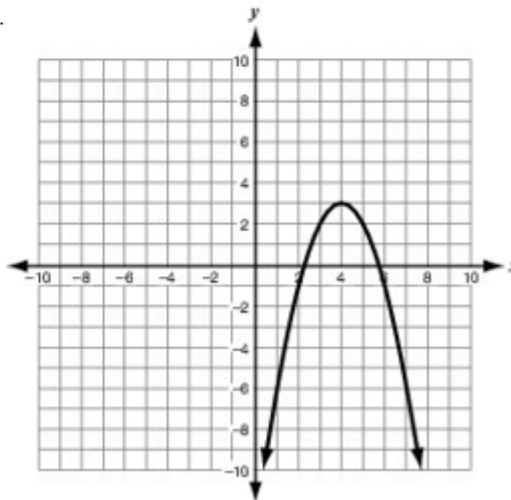
A.

C.

B.

D.

2. Mateas sells fresh-baked bread at his local farmers' market. To determine the best price he should charge for a loaf of bread, he changed the price each day over a 10-day period. He created a scatter plot to represent the relationship between the amount of revenue he made each day and the price he charged per loaf that day. He modeled the relationship by fitting a function to the data as shown below.
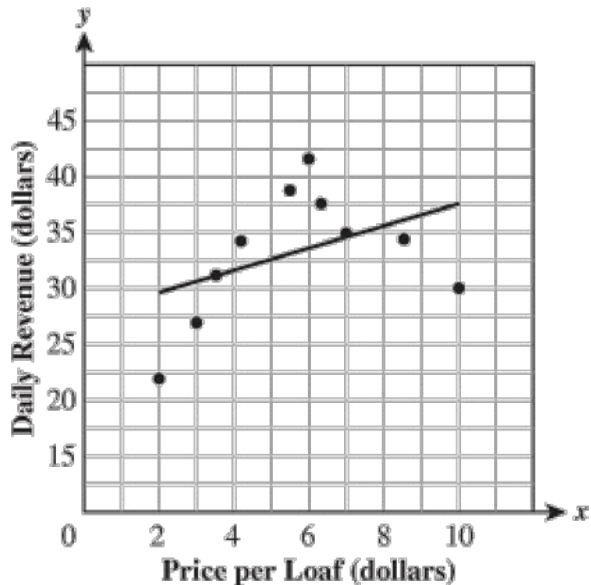
How could Mateas improve the fit of his model?

A. Mateas could decrease the sum of the residuals by fitting an exponential function to the data.

B. Mateas could increase the sum of the residuals by fitting an exponential function to the data.

C. Mateas could decrease the sum of the residuals by fitting a quadratic function to the data.

D. Mateas could increase the sum of the residuals by fitting a quadratic function to the data.

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3. Students at Southdale High School receive 3 hours of community service credit each time they volunteer at the local animal shelter. Southdale students need at least 25 hours of community service to graduate. A function can be created to model this relationship where the domain represents the number of times a student would volunteer. What is the minimum value of the domain for the function that would meet this graduation requirement?

4. Based on last week's sales, a store manager concluded that by pricing the store's pack of 12 donuts at $8, the store will sell about 80 packs per day. Raising the price to $8.50 per pack of 12 donuts will cause sales to fall to about 76 packs per day. If a linear model based on this data is used to predict the daily sales of y packs of donuts when the price per pack is x dollars, which statement is true about the slope of this linear model?

   A. If the price per pack increases by $8, the number of packs sold per day decreases by 1.

   B. If the price per pack increases by $4, the number of packs sold per day decreases by 1.

   C. If the price per pack increases by $1, the number of packs sold per day decreases by 4.

   D. If the price per pack increases by $1, the number of packs sold per day decreases by 8.

5. What is the most simple form of $12x^2[(3x^2+5x-2)+(x^2-12x+8)]$?

6. Johannes needs to buy replacement team uniforms and is looking at different prices. He has a budget of $300. He needs 18 pairs of pants and 12 shirts. Let x represent the cost of each pair of pants, and y represent the cost of each shirt. Which graph correctly shows the costs of pants and shirts Johannes can buy, if no tax is added?
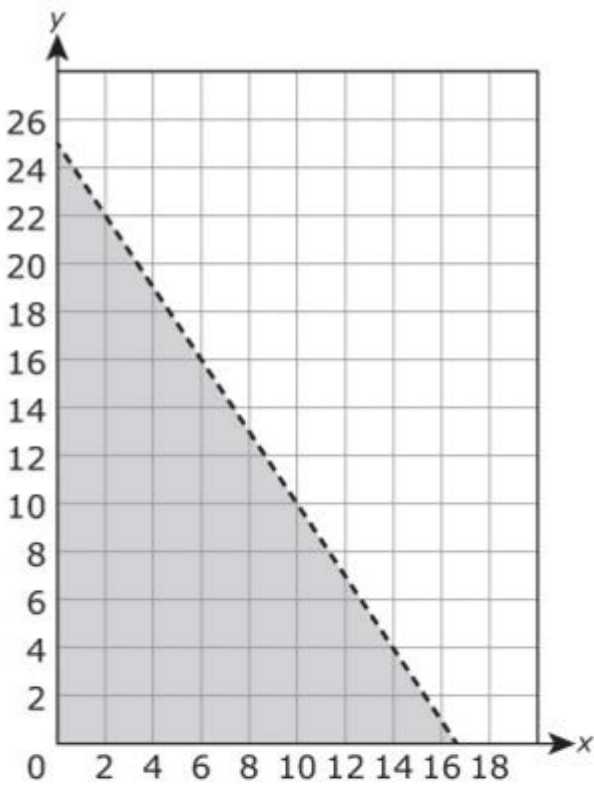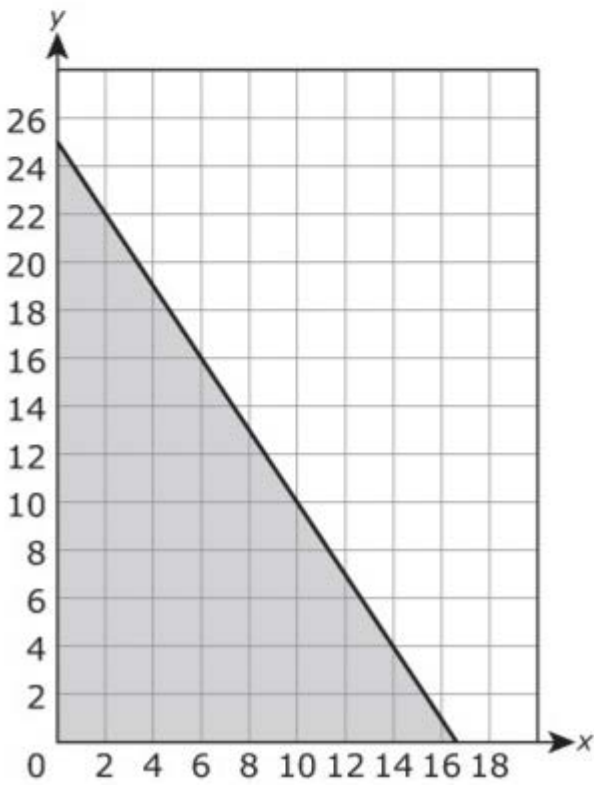
A.

B.

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C.

D.

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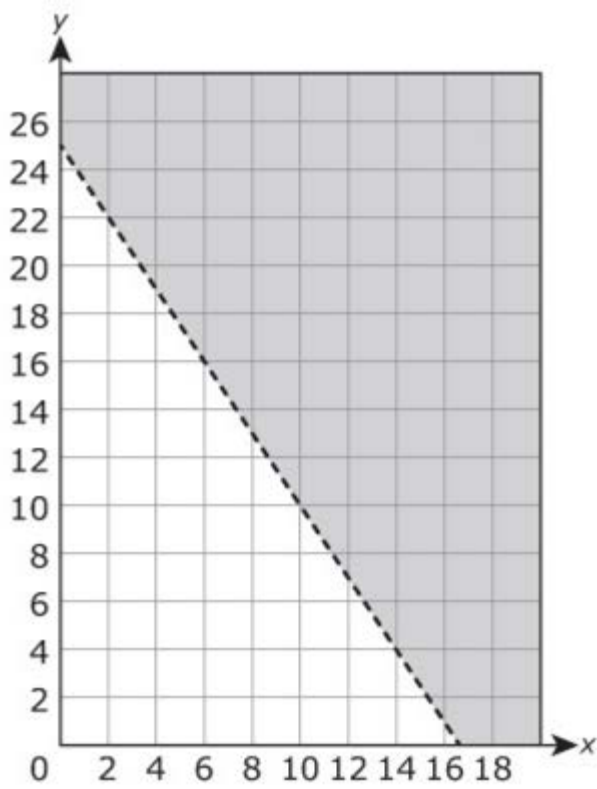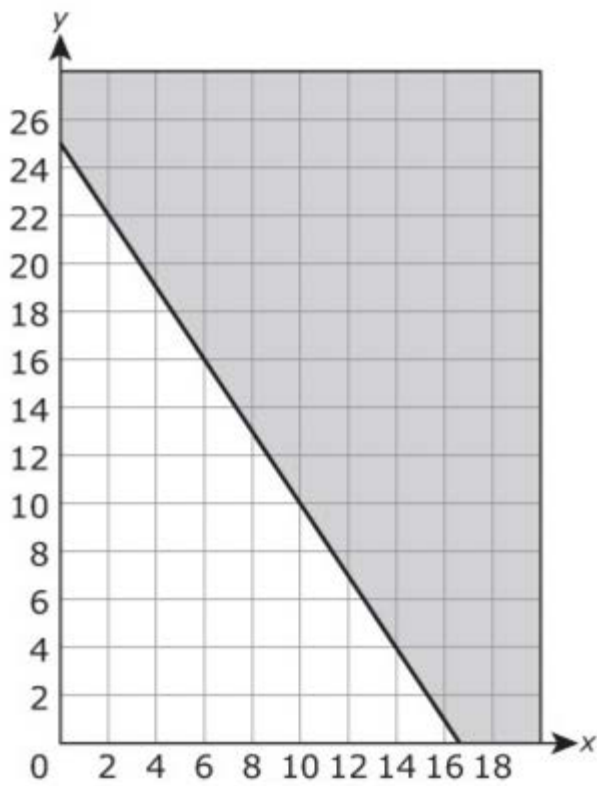
7. The ideal gas law takes the form $PV = nRT$ where P represents pressure, V represents volume, n represents number of moles of gas, R represents gas constant, and T represents temperature in Kelvins. Part A. Rearrange the formula to solve for the gas constant.

   Part B. Rearrange the formula to show the ratio of volume to temperature. Use words and/or numbers to show your work.

8. What is the value of k such that the point $(3, k)$ represents a solution to the equation $y = 1000(1.1)^x$?

   A. 367

   B. 1,100

   C. 1,331

   D. 3,300

9. What are the zeros of the function below?

   $$p(x) = x(x+3)(x-2)$$

10. What would be the solution of the following equation when solving for p?
    $$\frac{ap - r}{b} = p + q$$

    A. $\quad p = \frac{bq+r}{a-b}, a \neq b$

    B. $\quad p = \frac{bq-r}{a-b}, a \neq b$

    C. $\quad p = \frac{q+r}{a-b}, a \neq b$

    D. $\quad p = \frac{q-r}{a-b}, a \neq b$

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11. Lisa deposited money into a savings account that earned interest based on the amount she deposited. After time, she changed the account to earn interest based on the compounded amount. The graph below shows the change in the amount of dollars, y, in her account over x years.

LISA'S SAVINGS ACCOUNT

Amount (in dollars) vs. Time (in years)

For what interval of x is the rate of change constant?

12. When Marcia was born she weighed 8 pounds. At 8 months she weighed 20 pounds. If she continues to grow at the same rate, how many pounds will Marcia weigh when she becomes 1 year old?

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13. To help tourists plan and choose a season for their Florida vacation, a travel agency is updating their website. The agency is going to include bar graphs that display last year's rainfall patterns in all major tourist cities. Based on this information, which axis label will be **most** appropriate for a scale measuring the rate of rainfall on these bar graphs?

   A. inches per day

   B. inches per year

   C. inches per hour

   D. inches per month

14. Sam is driving to a friend's house in another city.

   Part A

   As he starts out, he passes a traffic camera in a school zone at a time when the speed limit is 25 miles per hour. The camera takes a picture every 1.5 seconds. The camera takes two pictures of Sam, and the traffic department determines that Sam has traveled 52.8 feet. Explain whether Sam is traveling within the speed limit. Show your work.

   Part B

   Sam has to drive 240 miles to his friend's house. He knows that his car's mileage is 28 miles per gallon. It takes Sam 4 hours to drive to his friend's house. On average, how many gallons does Sam's car use each hour that he drives? (Round your answer to the nearest tenth.) Explain your answer or show your work.
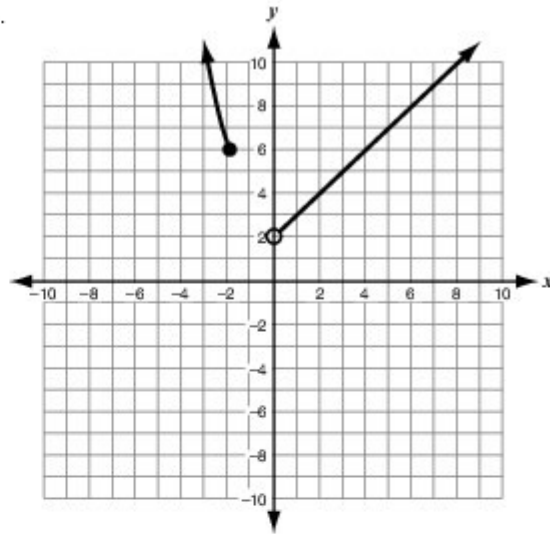
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15. Which graph best represents the function

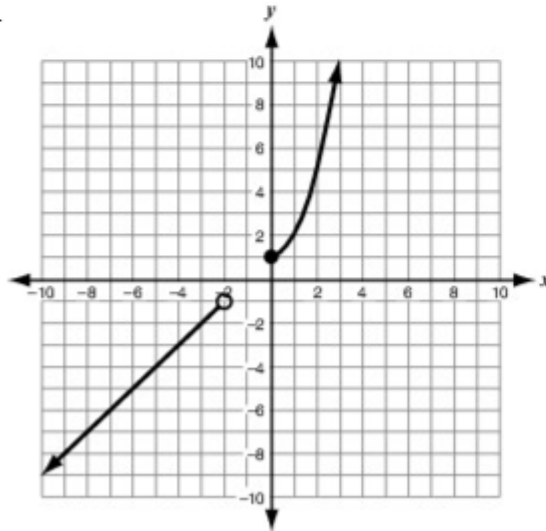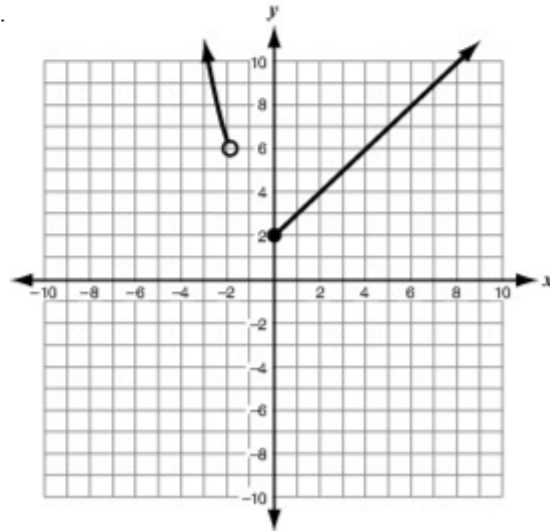$$f(x) = \begin{cases} x^2 + 1, \text{ if } x \geq 0 \\ x + 1, \text{ if } x < -2 \end{cases}?$$

A.
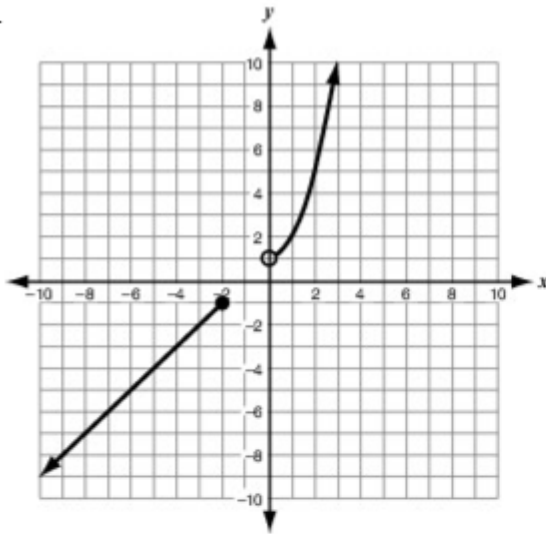
C.

B.

D.

16. Solve the equation.

$$x^2 - x - 56 = 0$$

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17. Which statement is an example of causation?

   A. When it rains, the playground gets wet.

   B. The height of children increases as their running speed increases.

   C. The increase in the number of ice-cream cones a vendor sells causes an increase in temperature.

   D. Students who eat a good breakfast each day are more physically active than those who skip breakfast.

18. A scientist observed an experiment in which the population of bacteria grew in such a way that it increased by 20% every hour. The initial population of the bacteria was 150. Write an exponential expression to describe the population of the bacteria at the end of t hours.

19. Use the graph to answer the question below.
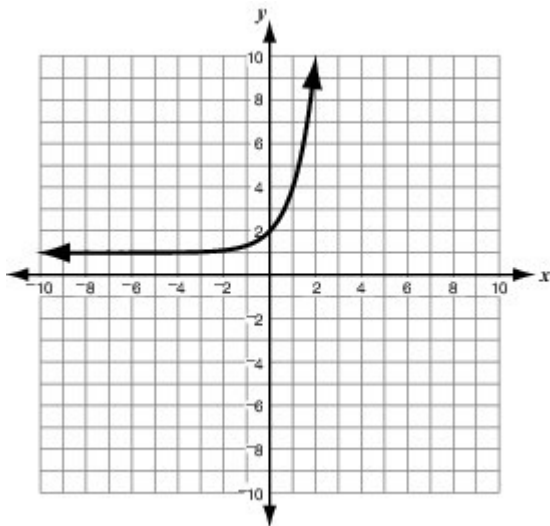
Which function best represents the graph?

A. $f(x) = 3^x$

B. $f(x) = 3^{x+1}$

C. $f(x) = 3^x - 1$

D. $f(x) = 3^x + 1$

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20. A ball is dropped to the ground from the top of a building. The height of the ball after x bounces can be represented by the expression $40(0.75)^x$. What does the 40 in the expression represent?

21. The value of a certain car after t years is modeled by the expression $15,000(0.7)^t$. What are the initial cost, I, and the rate of depreciation, r, of this car?

    A. $I = \$10{,}500, r = 30\%$

    B. $I = \$10{,}500, r = 70\%$

    C. $I = \$15{,}000, r = 30\%$

    D. $I = \$15{,}000, r = 70\%$

22. Peter kicks the soccer ball toward the goal during a match. The equation $h(t) = -0.1t^2 + 2.4t + 1.5$ represents the height of the ball above the ground when the ball is t feet away from the spot where it was kicked.

Part A. What is the y-intercept of this function? What does it mean in relation to when and where the ball is being kicked?

Part B. What was the maximum height of the ball? Explain your answer.

Part C. A player from the other team is standing directly between Peter and the goal at the time the ball was kicked. The player is 5 feet away from Peter and is 6 feet tall. Was the ball high enough at this time to go over the opponent's head? Explain how you know.

Part D. The goal is 25 feet away from Peter. Did he kick the ball far enough to make it to the goal without bouncing first? Explain how you know.

Use words and/or numbers to show your work.

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