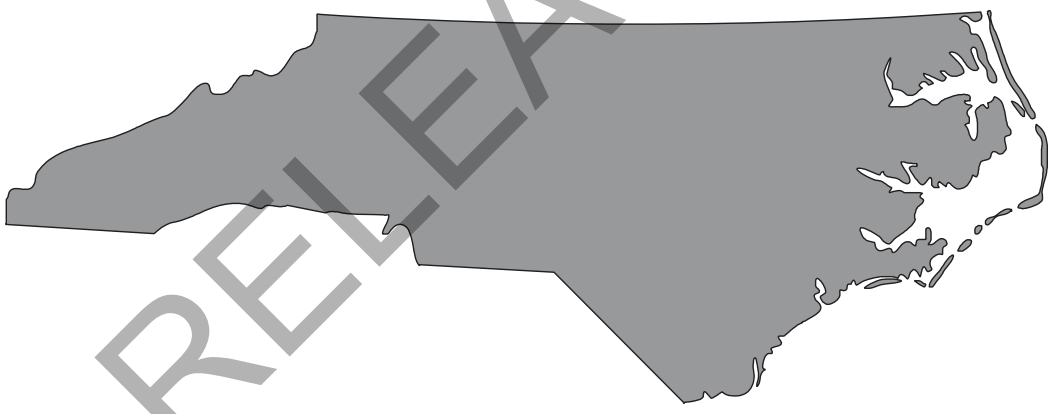
Revised 6/9/14

Released Form

North Carolina READY End-of-Course Assessment Math I



Student Booklet

Academic Services and Instructional Support
Division of Accountability Services

Sample Questions

S1 What is the value of x in the equation $2x + 7 = 1$?

S2 What is $1\frac{1}{2} \times 3$?

S3 What is 50% of 100?

A 5

B 50

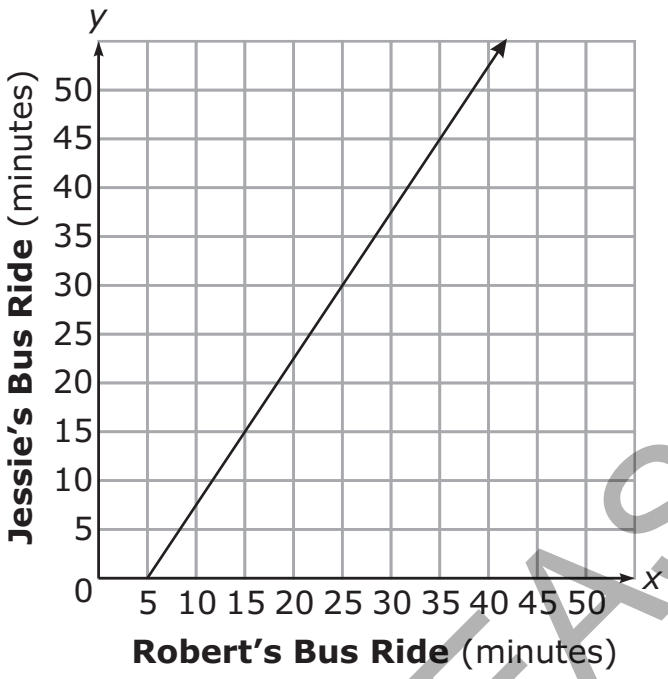
C 150

D 500

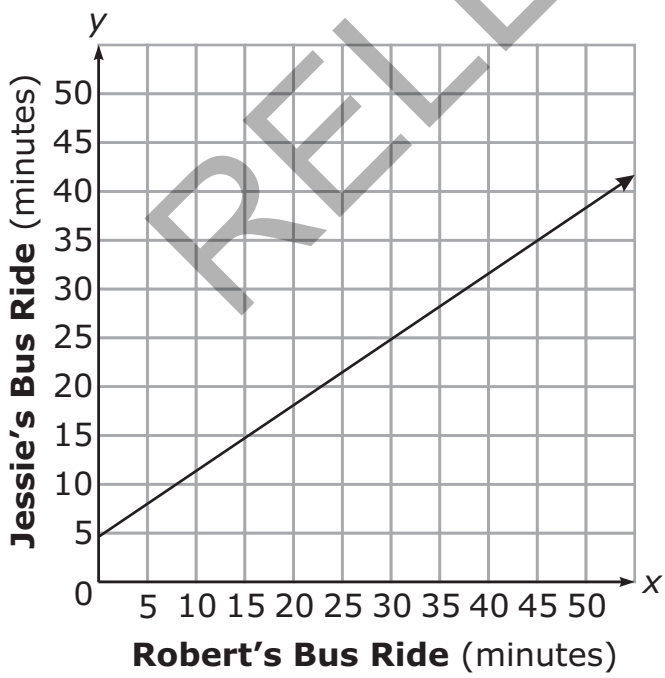
STOP

1 Jessie's bus ride to school is 5 minutes more than $\frac{2}{3}$ the time of Robert's bus ride. Which graph shows the possible times of Jessie's and Robert's bus rides?

A



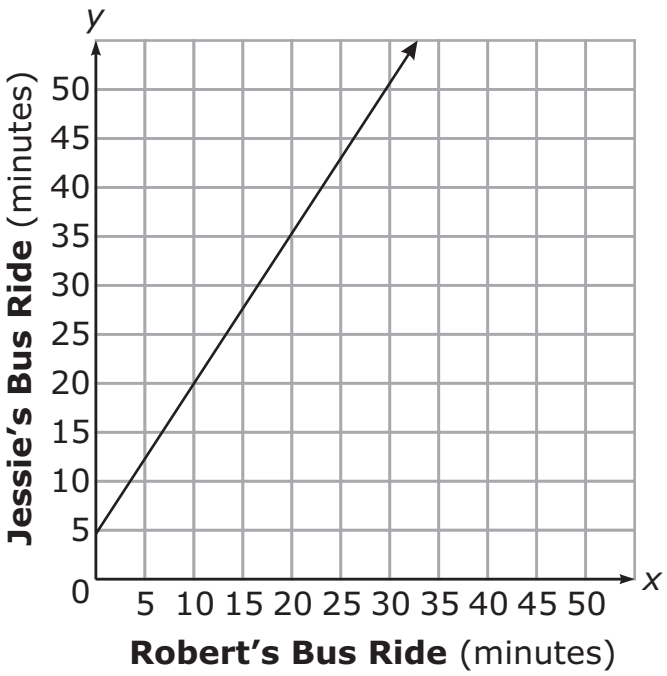
B



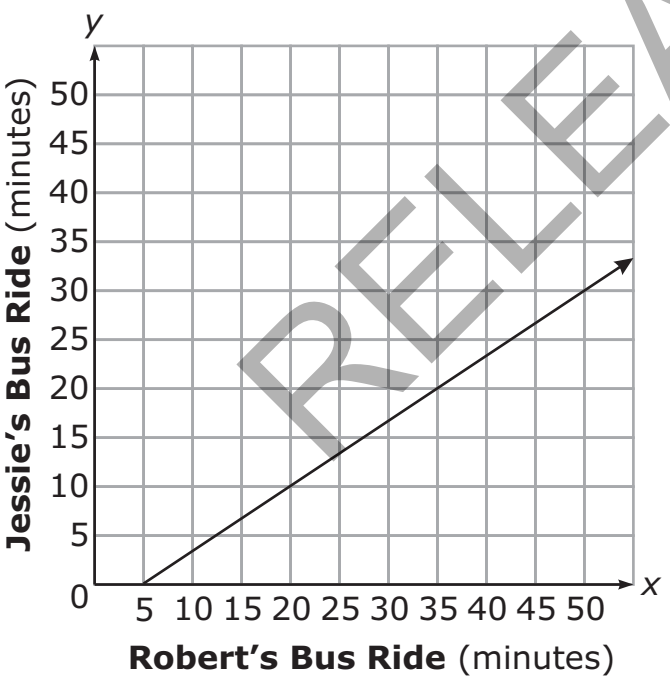
Answer choices C and D are on page 3.

Go to the next page.

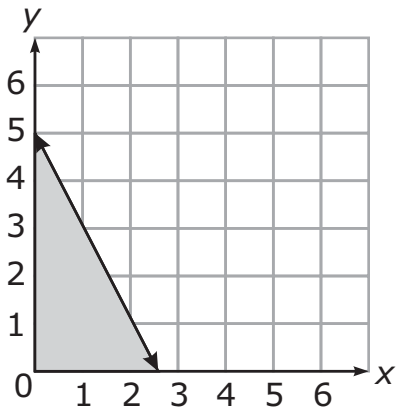
C


y
50
45
40
35
30
25
20
15
10
5
0
Jessie's Bus Ride (minutes)
5 10 15 20 25 30 35 40 45 50
x
Robert's Bus Ride (minutes)

D


y
50
45
40
35
30
25
20
15
10
5
0
Jessie's Bus Ride (minutes)
5 10 15 20 25 30 35 40 45 50
x
Robert's Bus Ride (minutes)

2 What scenario could be modeled by the graph below?



A The number of pounds of apples, y, minus two times the number of pounds of oranges, x, is at most 5.

B The number of pounds of apples, y, minus half the number of pounds of oranges, x, is at most 5.

C The number of pounds of apples, y, plus two times the number of pounds of oranges, x, is at most 5.

D The number of pounds of apples, y, plus half the number of pounds of oranges, x, is at most 5.

3 Which expression is equivalent to $t^2 - 36$?

A $(t - 6)(t - 6)$

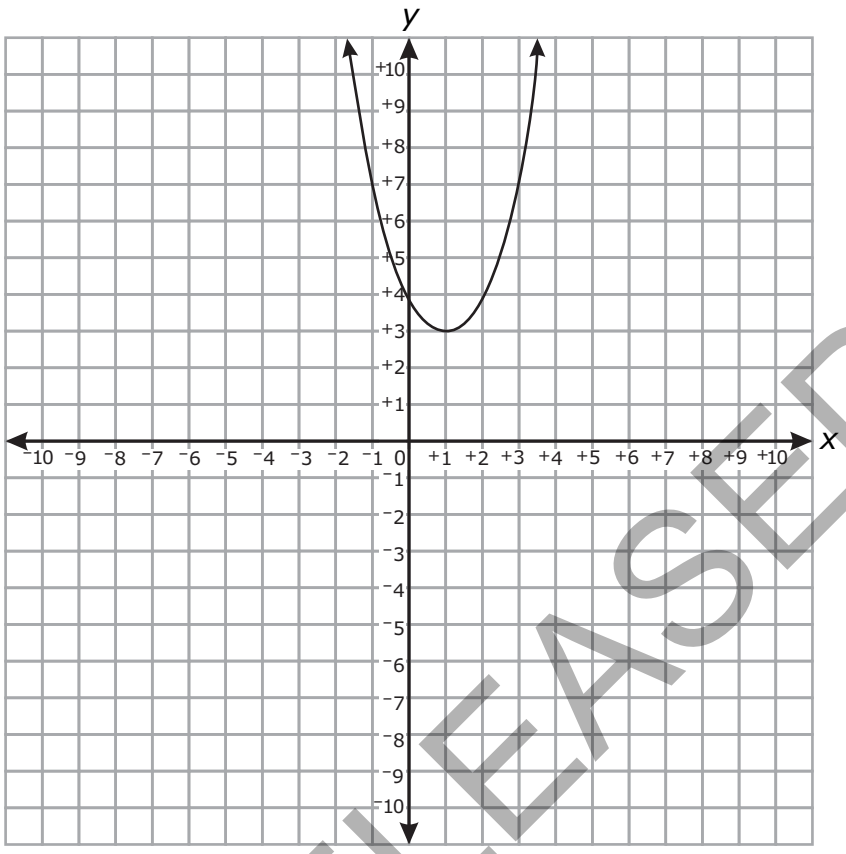
B $(t + 6)(t - 6)$

C $(t - 12)(t - 3)$

D $(t - 12)(t + 3)$

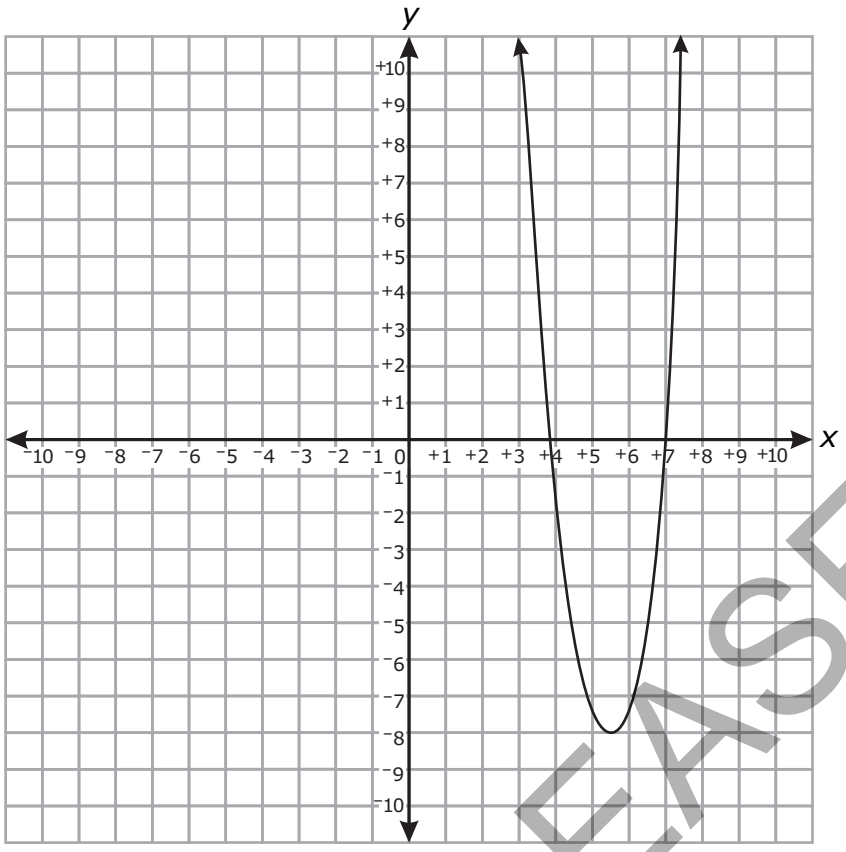
4 Which is the graph of the function $f(x) = 4x^2 - 8x + 7$?

A



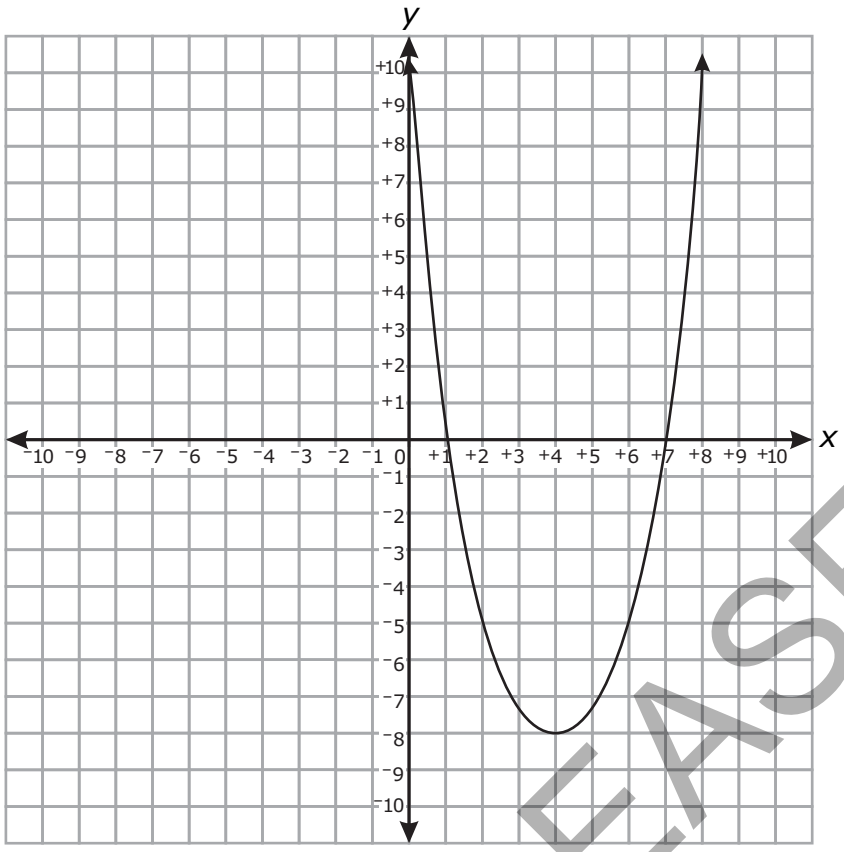
Answer choices B, C, and D are on the following pages.

B



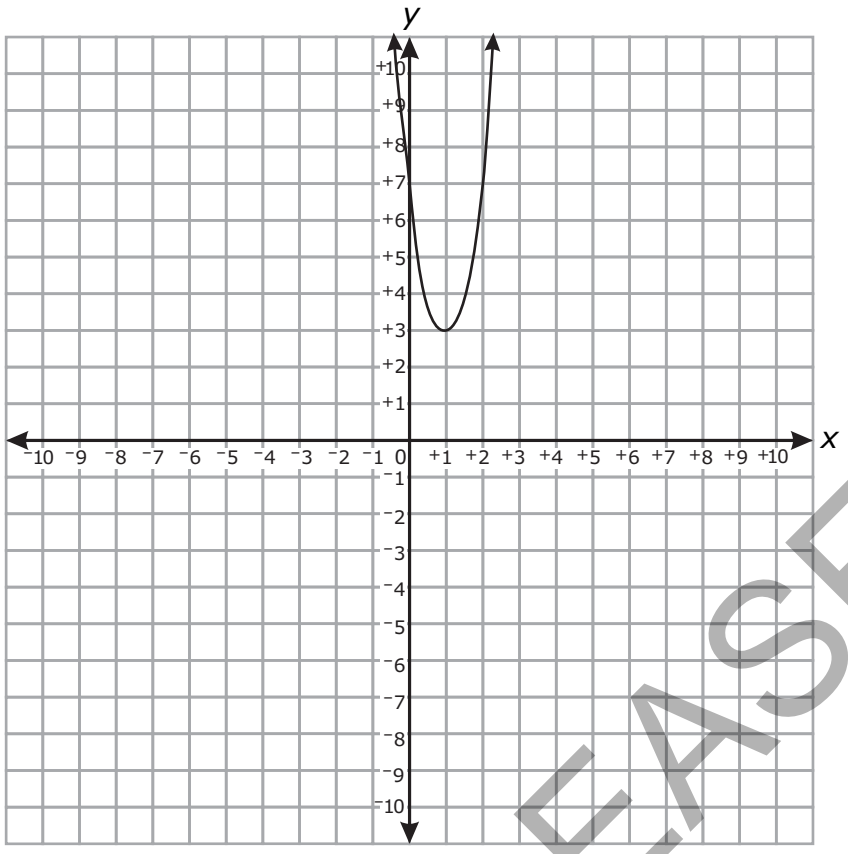
Answer choices C and D are on the following pages.

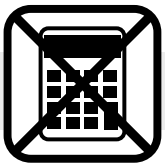
C



Answer choice D is on page 8.

D





5 The floor of a rectangular cage has a length 4 feet greater than its width, w. James will increase both dimensions of the floor by 2 feet. Which equation represents the new area, N, of the floor of the cage?

A $N = w^2 + 4w$

B $N = w^2 + 6w$

C $N = w^2 + 6w + 8$

D $N = w^2 + 8w + 12$

Questions 6 through 15 require you to write your answers in the boxes provided on your answer sheet. Write only one number or symbol in each box and fill in the circle in each column that matches what you have printed. Fill in only one circle in each column.

6 Two boys, Shawn and Curtis, went for a walk. Shawn began walking 20 seconds earlier than Curtis.

- Shawn walked at a speed of 5 feet per second.
- Curtis walked at a speed of 6 feet per second.

For how many seconds had Shawn been walking at the moment when the two boys had walked exactly the same distance?

7 The math club sells candy bars and drinks during football games.

- 60 candy bars and 110 drinks will sell for $265.
- 120 candy bars and 90 drinks will sell for $270.

How much does each candy bar sell for?

(Note: Express the answer in dollars.cents.)

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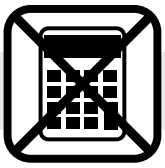
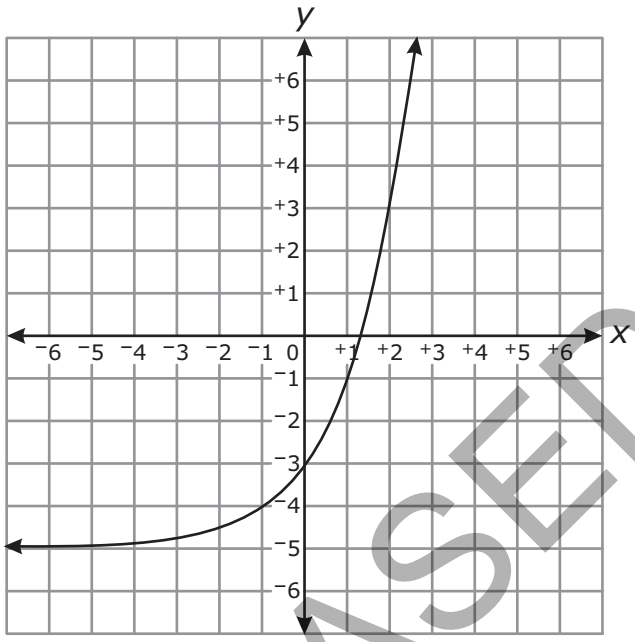


8 What is the smallest of 3 consecutive positive integers if the product of the smaller two integers is 5 less than 5 times the largest integer?

9 The function $f(t) = -5t^2 + 20t + 60$ models the approximate height of an object t seconds after it is launched. How many seconds does it take the object to hit the ground?

10 Two times Antonio's age plus three times Sarah's age equals 34. Sarah's age is also five times Antonio's age. How old is Sarah?

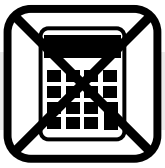
11 The function $f(x) = 2(2)^x$ was replaced with $f(x) + k$, resulting in the function graphed below.



What is the value of k?

12 Suppose that the function $f(x) = 2x + 12$ represents the cost to rent x movies a month from an internet movie club. Makayla now has $10. How many more dollars does Makayla need to rent 7 movies next month?

13 The larger leg of a right triangle is 3 cm longer than its smaller leg. The hypotenuse is 6 cm longer than the smaller leg. How many centimeters long is the smaller leg?



14 Katie and Jennifer are playing a game.

- Katie and Jennifer each started with 100 points.
- At the end of each turn, Katie's points doubled.
- At the end of each turn, Jennifer's points increased by 200.

At the start of which turn will Katie first have more points than Jennifer?

15 Alex walked 1 mile in 15 minutes. Sally walked 3,520 yards in 24 minutes. In miles per hour, how much faster did Sally walk than Alex?

(Note: 1 mile = 1,760 yards)

This is the end of the calculator inactive test questions.

Directions:

1. **Look back over your answers for the calculator inactive questions. You will not be able to go back and work on these questions once you are given a calculator.**

2. **Raise your hand to let your teacher know you are ready to begin the calculator active test questions.**

3. **Do not begin work on the calculator active test questions until your teacher has given you a calculator.**

16 Which expression is equivalent to $\sqrt[3]{8x^2y^3z^4}$?

A $2x^{\frac{3}{2}}yz^{\frac{3}{4}}$

B $2x^{\frac{2}{3}}yz^{\frac{4}{3}}$

C $\frac{2z}{x}$

D $\frac{2x}{z}$

17 A school purchases boxes of candy bars.

- Each box contains 50 candy bars.
- Each box costs $30.

How much does the school have to charge for each candy bar to make a profit of $10 per box?

A $0.40

B $0.50

C $0.80

D $1.25

18 Energy and mass are related by the formula $E = mc^2$.

- m is the mass of the object.
- c is the speed of light.

Which equation finds m, given E and c?

A $m = E - c^2$

B $m = Ec^2$

C $m = \frac{c^2}{E}$

D $m = \frac{E}{c^2}$

19 Suppose that the equation $V = 20.8x^2 - 458.3x + 3{,}500$ represents the value of a car from 1964 to 2002. What year did the car have the least value? ($x = 0$ in 1964)

A 1965

B 1970

C 1975

D 1980

20 Which expression is equivalent to $\left(x^{\frac{1}{3}}\right)^{-3}$?

A $\sqrt{x}$

B $\frac{1}{x}$

C $\frac{1}{x^9}$

D $\frac{1}{x^{27}}$

21 The table below shows the average weight of a type of plankton after several weeks.

Time (weeks)	**Weight** (ounces)
8	0.04
9	0.07
10	0.14
11	0.25
12	0.49

What is the average rate of change in weight of the plankton from week 8 to week 12?

A 0.0265 ounce per week

B 0.0375 ounce per week

C 0.055 ounce per week

D 0.1125 ounce per week

22 Dennis compared the y-intercept of the graph of the function $f(x) = 3x + 5$ to the y-intercept of the graph of the linear function that includes the points in the table below.

x	$g(x)$
$^{-}7$	2
$^{-}5$	3
$^{-}3$	4
$^{-}1$	5

What is the difference when the y-intercept of $f(x)$ is subtracted from the y-intercept of $g(x)$?

A $^{-}11.0$

B $^{-}9.3$

C 0.5

D 5.5

23 Cell phone Company *Y* charges a \$10 start-up fee plus \$0.10 per minute, x. Cell phone Company *Z* charges \$0.20 per minute, x, with no start-up fee. Which function represents the difference in cost between Company *Y* and Company *Z*?

A $f(x) = {}^{-}0.10x - 10$

B $f(x) = {}^{-}0.10x + 10$

C $f(x) = 10x - 0.10$

D $f(x) = 10x + 0.10$

24 Monica did an experiment to compare two methods of warming an object. The results are shown in the table below.

Time (Hours)	**Method 1 Temperature** (°F)	**Method 2 Temperature** (°F)
0	0	1.5
1	5	3
2	11	6
3	15	12
4	19	24
5	25	48

Which statement ***best*** describes her results?

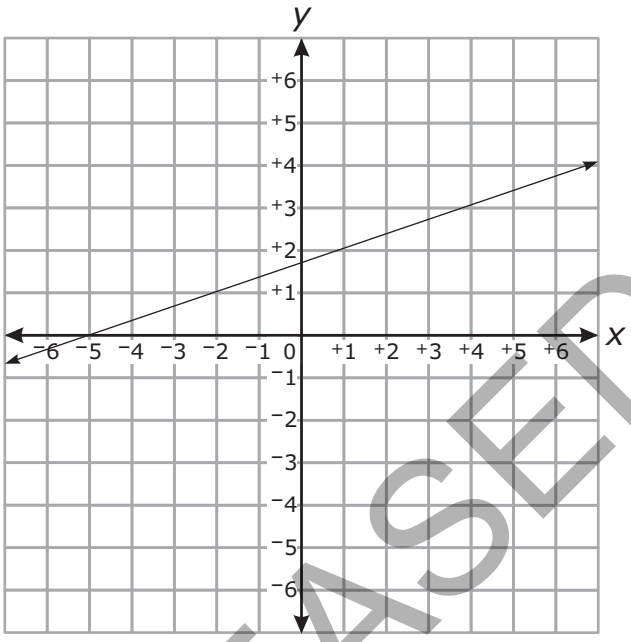
A The temperature using both methods changed at a constant rate.

B The temperature using both methods changed exponentially.

C The temperature using Method 2 changed at a constant rate.

D The temperature using Method 2 changed exponentially.

25 Mario compared the slope of the function graphed below to the slope of the linear function that has an x-intercept of $\frac{4}{3}$ and a y-intercept of $^{-}2$.



What is the slope of the function with the smaller slope?

A $\frac{1}{5}$

B $\frac{1}{3}$

C 3

D 5

26 The boiling point of water, T (measured in degrees), at altitude a (measured in feet) is modeled by the function $T(a) = {}^{-}0.0018a + 212$. In terms of altitude and temperature, which statement describes the meaning of the slope?

A The boiling point increases by 18 degrees as the altitude increases by 1,000 feet.

B The boiling point increases by 1.8 degrees as the altitude increases by 1,000 feet.

C The boiling point decreases by 18 degrees as the altitude increases by 1,000 feet.

D The boiling point decreases by 1.8 degrees as the altitude increases by 1,000 feet.

27 A line segment has endpoints $J(2, 4)$ and $L(6, 8)$. The point K is the midpoint of $\overline{JL}$. What is an equation of a line perpendicular to $\overline{JL}$ and passing through K?

A $y = {}^{-}x + 10$

B $y = {}^{-}x - 10$

C $y = x + 2$

D $y = x - 2$

28 A triangle has vertices at $(1, 3)$, $(2, {}^{-}3)$, and $({}^{-}1, {}^{-}1)$. What is the ***approximate*** perimeter of the triangle?

A 10

B 14

C 15

D 16

29 The table below shows the area of several states.

State	**Area** (thousands of square miles)
Connecticut	6
Georgia	59
Maryland	12
Massachusetts	11
New Hampshire	9
New York	54
North Carolina	54
Pennsylvania	46

Delaware has an area of 2,000 square miles. Which is true if Delaware is included in the data set?

A The mean increases.

B The range decreases.

C The interquartile range decreases.

D The standard deviation increases.

30 A college surveyed 3,500 of its students to determine if the students preferred music, movies, or sports. The results of the survey are shown in the relative frequency table below.

	Music	Movies	Sports
Freshmen	0.06	0.10	0.09
Sophomores	0.09	0.05	0.10
Juniors	0.10	0.06	0.08
Seniors	0.08	0.09	0.10

How many more seniors than juniors were included in the survey?

A 70

B 105

C 140

D 175

31 A book club has 200 members. Each member was asked whether he or she prefers fiction or nonfiction books. The results are shown in the relative frequency table below.

Age	Fiction	Nonfiction	Total
21–30	0.32	0.11	0.43
31–40	0.38	0.19	0.57
Total	0.70	0.30	1.00

Which statement is true?

A 6 more 31–40-year-olds than 21–30-year-olds prefer fiction.

B 38 members are 31–40 and prefer fiction.

C 43 members are 21–30 years old.

D 140 members prefer fiction.

32 The table below shows the distance a car has traveled.

Minutes	25	50	75	100	125
Distance Traveled (in miles)	20	40	60	80	100

What is the meaning of the slope of the linear model for the data?

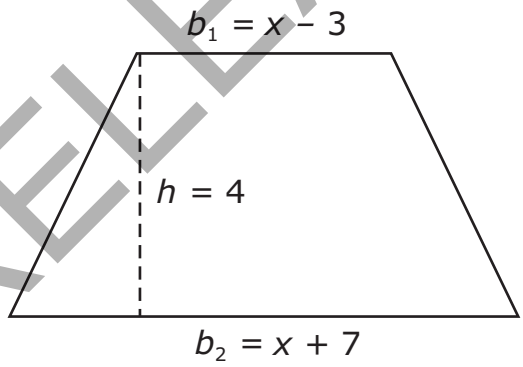
A The car travels 5 miles every minute.

B The car travels 4 miles every minute.

C The car travels 4 miles every 5 minutes.

D The car travels 5 miles every 4 minutes.

33 The area of a trapezoid is found using the formula $A = \frac{1}{2}h(b_1 + b_2)$, where A is the area, h is the height, and b_1 and b_2 are the lengths of the bases.



What is the area of the above trapezoid?

A $A = 4x + 2$

B $A = 4x + 8$

C $A = 2x^2 + 4x - 21$

D $A = 2x^2 + 8x - 42$

34 A company produces packs of pencils and pens.

- The company produces at least 100 packs of pens each day, but no more than 240.
- The company produces at least 70 packs of pencils each day, but no more than 170.
- A total of less than 300 packs of pens and pencils are produced each day.
- Each pack of pens makes a profit of $1.25.
- Each pack of pencils makes a profit of $0.75.

What is the maximum profit the company can make each day?

A $338.75

B $344.25

C $352.50

D $427.50

35 John mixed cashews and almonds.

- John bought 4 pounds of almonds for a total cost of $22.
- The cost per pound for cashews is 60% more than the cost per pound for almonds.
- John bought enough cashews that, when he mixed them with the almonds, the mixture had a value of $6.50 per pound.

Approximately what percent of the mixture, by weight, was cashews?

A 20%

B 25%

C 30%

D 35%

36 Lucy and Barbara began saving money the same week. The table below shows the models for the amount of money Lucy and Barbara had saved after x weeks.

Lucy's Savings	$f(x) = 10x + 5$
Barbara's Savings	$g(x) = 7.5x + 25$

After how many weeks will Lucy and Barbara have the same amount of money saved?

A 1.1 weeks

B 1.7 weeks

C 8 weeks

D 12 weeks

37 Collin noticed that various combinations of nickels and dimes could add up to \$0.65.

- Let x equal the number of nickels.
- Let y equal the number of dimes.

What is the domain where y is a function of x and the total value is \$0.65?

A {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13}

B {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13}

C {0, 1, 3, 5, 7, 9, 11, 13}

D {1, 3, 5, 7, 9, 11, 13}

38 The value of an antique car is modeled by the function $V(x) = 107{,}000(1.009)^{\left(\frac{2}{3}x\right)}$ where x is the number of years since 2005. By what ***approximate*** percent rate is the value of the car increasing per year?

A 0.04%

B 0.14%

C 0.60%

D 1.40%

39 The table below shows the cost of a pizza based on the number of toppings.

Number of Toppings (n)	**Cost** (C)
1	\$12
2	\$13.50
3	\$15
4	\$16.50

Which function represents the cost of a pizza with n toppings?

A $C(n) = 12 + 1.5(n - 1)$

B $C(n) = 1.5n + 12$

C $C(n) = 12 + n$

D $C(n) = 12n$

40 Paul sells chocolate chip cookies and peanut butter cookies.

- Baking a batch of chocolate chip cookies takes 1.75 cups of flour and 2 eggs.
- Baking a batch of peanut butter cookies takes 1.25 cups of flour and 1 egg.
- Paul has 10 cups of flour and 12 eggs.
- He makes $4 profit per batch of chocolate chip cookies.
- He makes $2 profit per batch of peanut butter cookies.

How many batches of peanut butter cookies should Paul make to maximize his profit?

A 1

B 2

C 5

D 8

41 The sequence below shows the number of trees a nursery plants each year.

2, 8, 32, 128, ...

Which formula could be used to determine the number of trees the nursery will plant next year, NEXT, if the number of trees planted this year, NOW, is known?

A $NEXT = 4 \bullet NOW$

B $NEXT = \frac{1}{4} NOW$

C $NEXT = 2 \bullet NOW + 4$

D $NEXT = NOW + 6$

42 There were originally 4 trees in an orchard. Each year the owner planted the same number of trees. In the 29th year, there were 178 trees in the orchard. Which function, $t(n)$, can be used to determine the number of trees in the orchard in any year, n?

A $t(n) = \frac{178}{29}n + 4$

B $t(n) = \frac{178}{29}n - 4$

C $t(n) = 6n + 4$

D $t(n) = 29n - 4$

43 The vertices of quadrilateral *EFGH* are $E(^{-}7, 3)$, $F(^{-}4, 6)$, $G(5, ^{-}3)$, and $H(2, ^{-}6)$. What kind of quadrilateral is *EFGH*?

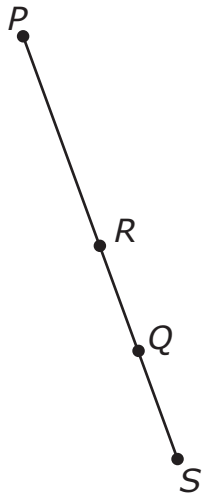
A trapezoid

B square

C rectangle that is not a square

D rhombus that is not a square

44 *R* is the midpoint of segment *PS*. *Q* is the midpoint of segment *RS*.



P is located at (8, 10), and *S* is located at (12, $^{-}$6). What are the coordinates of *Q*?

A (4, 2)

B (2, $^{-}$8)

C (11, $^{-}$2)

D (10, 2)

45 The sequence below shows the total number of days Francisco had used his gym membership at the end of weeks 1, 2, 3, and 4.

4, 9, 14, 19, ...

Assuming the pattern continued, which function could be used to find the total number of days Francisco had used his gym membership at the end of week n?

A $f(n) = n + 5$

B $f(n) = 5n - 1$

C $f(n) = 5n + 4$

D $f(n) = n^2$

46 The volume of a sphere is 2,400 cubic centimeters. What is the ***approximate*** diameter of this sphere? $\left(\text{Volume of a sphere} = \frac{4}{3}\pi r^3\right)$

A 16.6 cm

B 10.1 cm

C 8.3 cm

D 4.2 cm

47 The number of points scored by a basketball player in the first eight games of a season are shown below.

15, 35, 18, 30, 25, 21, 32, 16

What would happen to the data distribution if she scored 24, 22, 27, and 28 points in her next four games?

A The data distribution would become less peaked and more widely spread.

B The data distribution would become less peaked and less widely spread.

C The data distribution would become more peaked and less widely spread.

D The data distribution would become more peaked and more widely spread.

48 The table below shows the shoe size and age of 7 boys.

Name	Shoe Size (x)	Age (y)
Tyrone	6	9
Marcel	6	11
Patrick	7	15
Bobby	8	11
Dylan	9	15
Mike	10	16
Jonathan	12	17

Approximately what percent of the boys' ages is more than 1 year different from the age predicted by the line of best fit for the data?

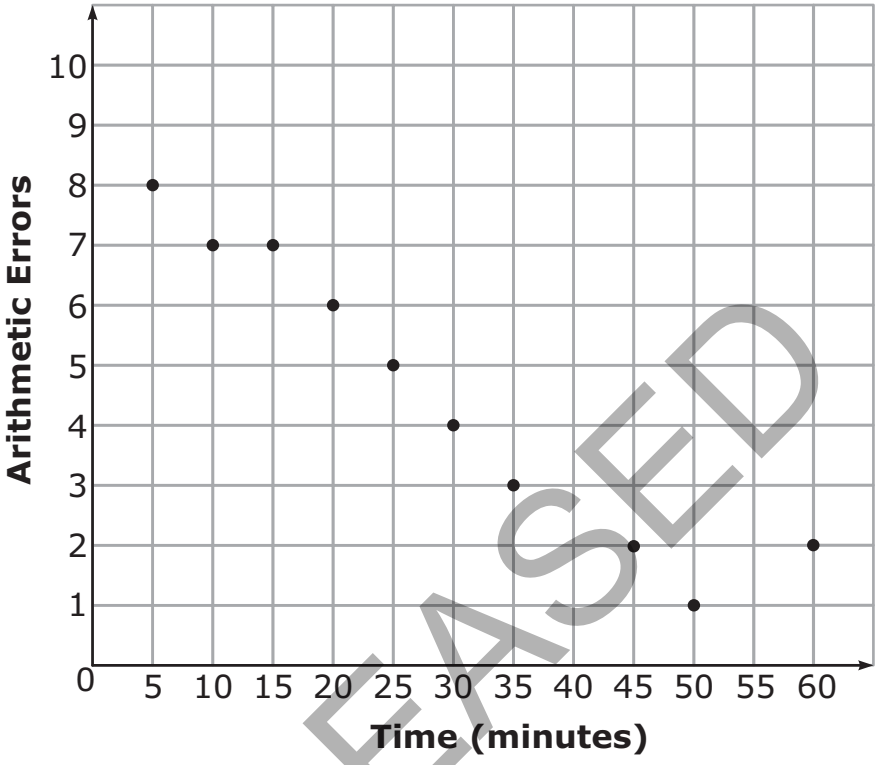
A 14%

B 29%

C 43%

D 57%

49 The scatterplot below shows the number of arithmetic errors 10 students made on a quiz and the amount of time the students took to complete the quiz.



Which describes the relationship between the number of arithmetic errors the students made and the amount of time the students took to complete the quiz?

A There is a strong positive relationship between the variables.

B There is a strong negative relationship between the variables.

C There is a weak positive relationship between the variables.

D There is a weak negative relationship between the variables.

50 An elevator can hold a maximum of 1,500 pounds. Eight people need to use the elevator. Bill had some measures from the data set of how much each person weighed. Which measure would be most useful to determine if the people can safely use the elevator?

A mean

B median

C mode

D interquartile range

Directions:

This is the end of the Math I test.

1. **Put all of your papers inside your test book and close your test book.**
2. **Place your calculator on top of the test book.**
3. **Stay quietly in your seat until your teacher tells you that testing is finished.**

STOP