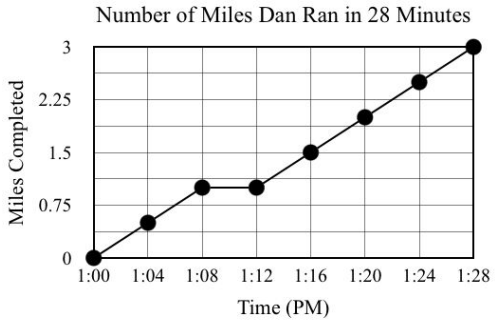
COLLEGE READINESS INITIATIVE

Test Three: Math with Calculator
Additional Problems

Once you have read through the test marked Test Three: Math with Calculator and understand the solutions, complete the following practice test to reinforce what you have just learned. Good luck!

Question 1



Dan takes 28 minutes to run 3 miles. The graph above shows the time intervals in which he runs the 3 miles. For how many minutes did Dan stop to rest during his run?

A) 0 minutes
B) 4 minutes
C) 8 minutes
D) 12 minutes

Written by Nicole D'Onofrio

Question 2 A

	Age		Total
Gender	Under 10	10 or older	
Male	5	13	18
Female	12	3	15
Total	17	16	33

The table above shows the distribution of age and gender for students who entered a race. IF the race winner will be selected at random, what is the probability that the winner will be either a male under age 10 or a female age 10 or older?

A) 8/33
B) 25/33
C) 15/33
D) 16/33

Question 2 B

	White Hair	Black Hair	Hairless	Total
Male	652	326	729	1707
Female	485	723	500	1708
Total	1137	1049	1229	3415

A Laboratory is studying the effects of a certain drug in mice.
The drug causes the hair color of the mice to change.
If a mouse is selected at random, what is the probability that the mouse that is selected is a hairless female?

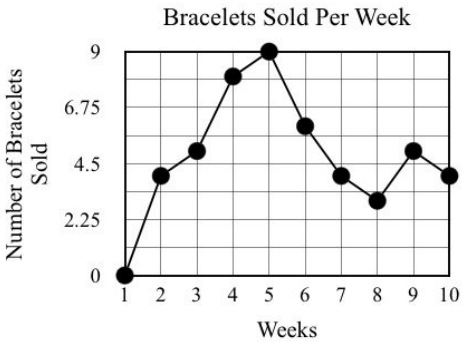
A) $\frac{243}{1138}$

B) $\frac{100}{683}$

C) $\frac{500}{1229}$

D) $\frac{1229}{3415}$

Question 3



The graph above shows the number of bracelets a company sold over the course of 10 weeks. During which of the 10 weeks did bracelet sales increase?

A) Weeks 1-5 and Weeks 8-9
B) Weeks 5-8 and Weeks 9-10
C) Weeks 1-5 and Weeks 8-9
D) Weeks 1-8

Written by Nicole D'Onofrio

Question 4 A

x	-1	0	1	2
f(x)	-4	2	8	14

A) $f(x) = x + 3$
B) $f(x) = 2x + 6$
C) $f(x) = 4x + 1$
D) $f(x) = 6x + 2$

Written by Nicole D'Onofrio

Question 4 B

x	2	3	5	7
$g(x)$	-1	1	5	9

Given the function above, what is the y-intercept of $g(x)$?

A) $y = -5$
B) $y = 2.5$
C) $y = -3$
D) $y = -7$

Question 5 A

At Lincoln High School, approximately 8 percent of enrolled juniors and 3 percent of enrolled seniors joined national spelling contest last year. If there were 584 juniors and 495 seniors enrolled in Lincoln High School last year, which of the following is closest to the total number of juniors and seniors at Lincoln High School last year who joined national spelling contest?

A) 45
B) 62
C) 58
D) 20

Question 5 B

At Scotch Plains Fanwood High School, about 16% of seniors participate in Intramural sports and about 10% of Juniors participate in intramural sports. If there are 397 students in the senior class, and 416 students in the junior class, about how many total students, juniors and seniors combined, participate in intramural sports?

A) 106
B) 105
C) 103
D) 108

Written by Nicole D'Onofrio

Question 6 A

$6x^2 + 3x - 2$
$2x^2 - 8x - 4$

Which of the following is the sum of the two polynomials shown above?

A) $8x^2 - 5x - 6$
B) $8x^2 + 5x + 6$
C) $8x^4 - 5x^2 - 6$
D) $8x^4 + 5x^2 + 6$

Question 6 B

$$-4x^3 + 2x^5 - x^2 + 5$$
$$-3x^5 + 4x^4 + 7x^2$$

What is the sum of the two polynomials above?

A) $-7x^8 + 6x^9 + 6x^2 + 5$
B) $5x^5 + 6x^2 - 4x^3 + 4x^4 + 5$
C) $-1x^5 - 4x^4 - 4x^3 + 5$
D) $-1x^5 + 4x^4 - 4x^3 + 6x^2 + 5$

Question 7

If (7/3)a = ⅝, what is the value of a?

A) 7/5
B) 5/7
C) 9/35
D) 35/9

Question 8

The average number of workers per department in West Chocolate Factory from 2006 to 2016 can be modeled by the equation $y = 0.45x + 36.9$, where x represents the number of years since 2006, and y represents the average number of workers per department. Which of the following best describes the meaning of the number 0.45 in the equation?

A) The average number of workers per department in 2006
B) The estimated increase in the average number of workers per classroom each year.
C) The total number of workers at the factory in 2006
D) The estimated difference between the average number of workers per department in 2016 and in 2006

Question 9 A

Andre runs 80 meters in 12.5 seconds. If he runs at this same rate, which of the following is closest to the distance he will run in 3 minutes?

A) 782 meters
B) 976 meters
C) 1,152 meters
D) 1,369 meters

Question 9 B

Liam swims 25 meters in 12 seconds.
If Liam swims at a constant pace, about how many seconds hours will it take for Liam to swim from the United States to Cuba (180,000 meters)

A) 7200
B) 3600
C) 86400
D) 172800

Questions 10 and 11 refer to the following information and chart.

Location	Acceleration (m/sec^2)
A	2.8
B	4.0
C	3.2
D	4.8

The chart above shows the approximate accelerations due to gravity, in meters per second squared, of 4 different locations. The weight of an object at a given location can be calculated by using the formula W=mg. W is the weight of an object in newtons, m is the mass of an object in kilograms, and g is the acceleration due to gravity at a location measured in meters per second squared.

Question 10

Object C weighs 12.8 newtons. The mass of Object A is 2 kilograms less than Object C. What is the weight of Object A?

A) 12.8 newtons
B) 4.0 newtons
C) 5.6 newtons
D) 2.8 newtons

Written by Nicole D'Onofrio

Question 11

An object weighs 48 newtons at Location B. Where would the same object weigh 57.6 newtons?

A) Location A
B) Location C
C) Location D
D) None of the Above

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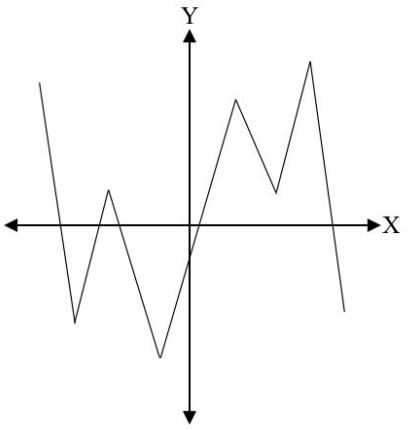
Question 12

The graph of g is depicted below. How many distinct zeros does the graph of g have?



A) 5
B) 6
C) 8
D) 4

Written by Nicole D'Onofrio

Question 13

$h = 13t^2 - ct + b$

The equation above gives the height h, in meter, of a ball t seconds after it is thrown straight up with an initial speed of c meter per second from a height of b meter. Which of the following gives c in terms of h, t, and b?

A) $c = b - h + 13t$
B) $c = (b - h + 13)/t$
C) $c = (b - h)/t + 13t$
D) $c = (b+h)/t + 13t$

Question 14

The cost of renting a car in Richmond is \$0.95 per hour. Which of the following equations represents the total cost c, in dollars, for d days of car rent?

A) $c = 0.95(24d)$
B) $c = 0.95d + 24$
C) $c = 0.95d/24$
D) $c = 24d/0.95$

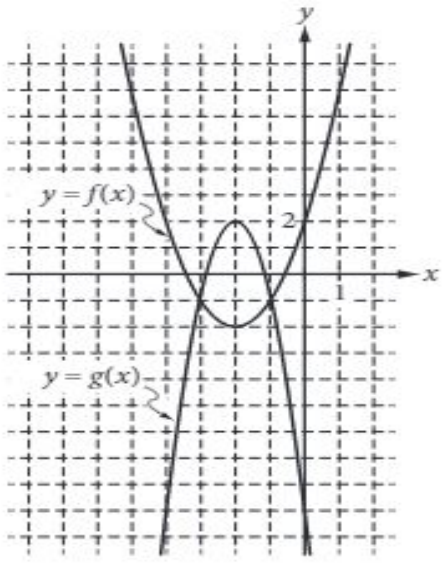
Written by Nicole D'Onofrio

Question 15

In order to determine if treatment X is successful in improving eyesight, a research study was conducted. From a large population of people with poor eyesight. 700 participants were selected at random. Half of the participants were randomly assigned to receive treatment X. The resulting data showed that participants who received treatment X had significantly improved eyesight as compared to those who did not receive treatment X. Based on the design and results of the study, which of the following is an appropriate conclusion?

A) Treatment X will improve the eyesight of anyone who takes it.
B) Treatment X improves eyesight better than all other available treatments.
C) Treatment X is likely to improve the eyesight of people who have poor eyesight.
D) Treatment X will cause a substantial improvement in eyesight.

Question 16



Graphs of the functions *f* and *g* are shown in the xy-plane above. For which of the following values of x does $f(x) + g(x) = -2$

A) -1
B) 0
C) 3
D) -2

Question 17

$S(P) = \frac{1}{2} P + 40$
$D(P) = 220 - P$

The quantity of a product supplied and the quantity of the product demanded in an economic market are functions of the price of the product. The functions above are the estimated supply and demand functions for a certain product. The function S(P) gives the quantity of the product supplied to the market with the price is P dollars, and the function D(P) gives the quantity of the product demanded by the market when the price is P dollars.

How will the quantity of the product supplied to the market change if the price of the product is increased by $5 ?

A) The quantity supplied will increase by 2 units.
B) The quantity supplied will decrease by 1 units.
C) The quantity supplied will increase by 1.5 units.
D) The quantity supplied will increase by 2.5 units.

Question 18

At what price will the quantity of the product supplied to the market be greater than the quantity of the product demanded by the market?

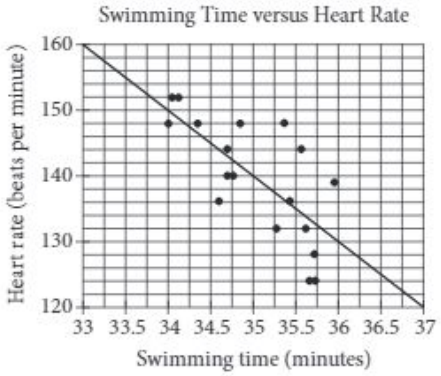
A) $150
B) $ 120
C) $100
D) $90

Question 19

Graphene, which is used in manufacture of integrated circuits, is so thin that a sheet weighing one ounce can cover up to 7 football fields. "If a football field has an area of approximately $1\ \frac{1}{3}$ acres, about how many acres could 60 ounces of graphene cover?

A) 325
B) 240
C) 560
D) 590

Question 20



Michael swam 2,000 yards on each of eighteen days. The scatterplot above shows his swim time for and corresponding heart rate after each swim. The line of best fit for the data is also shown. For the swim that took 35.25 minutes, Michael's actual heart rate was about how many beats per minutes less than the rate predicted by the line of best fit?

A) 4
B) 6
C) 2
D) 8

Question 21

Of the following four types of savings account plans, which option would yield linear growth of the money in the account?

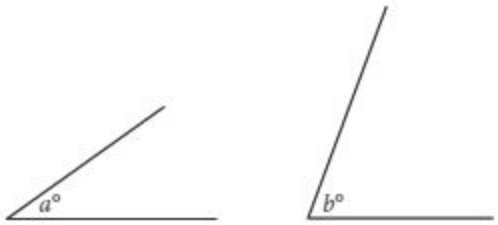
A) Each successive year, 3% of the initial savings is added to the value of the account.
B) Each successive year, $200 is added to the value of the account.
C) Each successive year, 2.5% of the initial savings and $50 is added to the value of the account.
D) Each successive year, 5% of the current value is added to the value of the account.

Question 22

The sum of three numbers is 255. One of the numbers, x is 50% more than the sum of the other two numbers. What is the value of x ?

A) 413
B) 570
C) 214
D) 153

Question 23



Note: Figures not drawn to scale.

The angles shown above are acute and
$\sin(a^o) = \cos(b^o)$. If a = 2k-11 and b=3k-7, what is the value of k?
5k=108

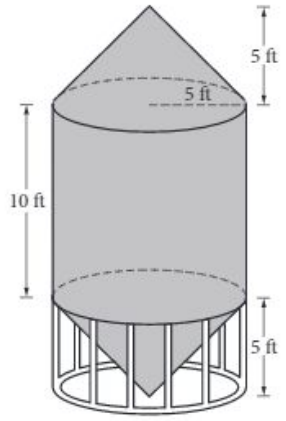
A) 12.5
B) 21.6
C) 5.5
D) 18.3

Question 24

Mr. Kohl has a beaker containing n milliliters of solution to distribute to the students in his chemistry class. If he gives each student 5 milliliters of solution, he will have 7 milliliters left over. In order to give each student 6 milliliters of solution, he will need an additional 21 militiers. How many students are in the class?

A) 28
B) 16
C) 21
D) 23

Question 25



A grain silo is built from two right circular cones and a right circular cylinder with internal measurements represented by the figure above. Of the following, which is closest to the volume of the grain silo, in cubic feet?

A) 261.8
B) 100
C) 80.3
D) 45

Question 26

In the xy-plane, the line determined by the points $(4,k)$ and $(k,16)$ passes through the origin. Which of the following could be the value of k ?

A) 2
B) 4
C) 8
D) 1

Question 27

A rectangle was altered by increasing its length by 10 percent and decreasing its width by p percent. If these alterations decreased the area of the rectangle by 15 percent, what is the value of p ?

A) 12
B) 15
C) 20
D) 22

Question 28

In planning maintenance for a city's infrastructure, a civil engineer estimates that, starting from the present, the population of the city will decrease by 10 percent every 20 years. If the present population of the city is 100,000, which of the following expressions represents the engineer's estimate of the population of the city t years from now?

A) $100{,}000(0.10)^{20t}$
B) $100{,}000(0.10)^{\frac{t}{20}}$
C) $100{,}000(0.9)^{20t}$
D) $100{,}00(0.9)^{\frac{t}{20}}$

Question 29

	Handedness	
Gender	Left	Right
Female		
Male		
Total	18	122

The incomplete table above summarizes the number of left-handed students and right-handed students by gender for the eighth-grade students at Keisel Middle School. There are 5 times as many right-handed female students as there are left-handed female students, and there are 9 times as many right-handed male students as there are left-handed male students. If there is a total of 20 left-handed students and 130 right handed students in the school, which of the following is closest to the probability that a right-handed student selected at random is female? (Note: Assume that none of the eighth-grade students are both right-handed and left-handed.)

A) 0.410
B) 0.385
C) 0.333
D) 0.250

Question 30

$3x + b = 5x - 7$
$3y + c = 5y - 7$

If b is c minus $\frac{1}{4}$, which of the following is true?

A) x is y minus $\frac{1}{4}$.
B) x is y minus $\frac{1}{2}$.
C) x is y minus 1.
D) x is y plus 4

Question 31

The school play sells $3 tickets to students and $5 tickets to the public. If Jody spends at least $25 but no more than $30 on 4 student tickets and x public tickets, what is a possible value of x?

Question 32

Heights of the Players on the Panthers Basketball Team

Player Name	Height (in.)	Player Name	Height (in.)
Jake	74	Stephen	80
Robbie	73	Parker	70
Calvin	72	Alex	73
Matthew	77	Chris	76
Eric	75	Andrew	74
Avery	78	Isaiah	68

The heights of the players on the Panthers basketball team are listed above. Using the information in the table, find the mean height in inches of the players. (Round your answer to the nearest tenth).

Question 33

$(6x^2 + 10x - 4) - 8(2x^2 + 3x + 5)$

If the above expression is rewritten in the form ax^2 + bx + c, where a, b, and c are constants, what is the value of b?

Question 34

In a circle with center O, central angle XOY has a measure of $\frac{7\pi}{6}$ radians. What fraction of the area of the circle is taken up by the sector XOY? (Round answer to the nearest tenth)

Question 35

A movie rating system operates on a scale from 0 to 100, inclusive. After its release, a movie's first 15 ratings averaged (arithmetic mean) out to be 72. Within the next 3 ratings, what is the lowest rating the movie can receive while keeping its total rating after 18 entries above 75?

Question 36

$$y \leq 18x + 70$$
$$y \leq 4x$$

In the xy-plane, a point (a,b) lies at the solution of the system of inequalities provided above. What is the minimum possible value of b?

The information below applies to questions 37 and 38.

Little's Law defines the average number of shoppers in a store at any given time:

N = r (T)

N represents the average number of shoppers in the store at a given time. r represents the average rate of of shoppers per minute. T represents the average time for which the shoppers are in the store. Money Saver Store decides to use Little's Law. They estimate that while open, an average of 5 shoppers per minute enter the store. These shoppers stay an average of 10 minutes. Using Little's Law, the store discovers that there are 50 shoppers in the store at any given time.

Question 37

While Little's Law is often used for entire stores, it can also be used for subsections of the store such as the bakery. If 60 shoppers order something from the bakery each hour, spending an average of 5 minutes at the bakery, how many people are waiting in line at the bakery at any given point in time?

Question 38

Money Saver Store opens up a new store and collects some information using Little's Law. They find that the new store generates 120 shoppers per hour, each staying for an average of 16 minutes. Is the average number of shoppers in the new store more or less than the average number of shoppers in the old store? Write your answer as a positive or negative percentage change from the old store to the new store?

Great work! Click on the "Additional Problems Key" to score your test. Then redo the problems that you scored incorrectly.