



Test Four: 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

The monthly subscription for an online music site is \$11.20. The subscription fee includes all songs online, but there is an additional fee of \$.20 to download each music video online. For 2 months, Nicole's fees totaled to \$23.60. In those two months, how many music videos did Nicole download from the site?

- A) 0
- B) 5
- C) 6
- D) 2

Written by Nicole D'Onofrio

Question 2

In order to compete in next month's race, Sam must be able to run at a speed of 8 mph. Sam can currently run at a speed of 5.8 mph. With training, he believes he will be able to increase his speed by .5 mph each week. Which of the following represents the speed in mph at which Sam believes he will be able to run w weeks from now?

- A) $14.6 + w$
- B) $.5 + 5.8$
- C) $.5 + 5.8w$
- D) $5.8 + .5w$

Written by Nicole D'Onofrio

Question 3

A 6 pound watermelon is sliced into 3 even pieces. Then those 3 pieces are sliced into 4 even pieces. What is the weight, in ounces, of each of the pieces?

(1 pound = 16 oz)

- A) 8
- B) 16
- C) .5
- D) 4

Written by Nicole D'Onofrio

Question 4

Ryan surveyed a random sample of college students to determine what type of music they prefer to listen to while they study. Of the 110 students Ryan surveyed, 11.5% of students preferred country, 32.2% of students preferred rap music, and 52.3% of students preferred classical. If this sample is representative, how many students would we expect to prefer country music while they study, in a college class of 2,000 students.

- A) 200
- B) 260
- C) 115
- D) 110

Written by Nicole D'Onofrio

Question 5

The area of a circle is equal to π times the diameter. What is the diameter, in centimeters if the area of a circle equals 16 square centimeters.

- A) $16/\pi$
- B) $\pi/16$
- C) 4
- D) 4π

Written by Nicole D'Onofrio

Question 6

Last night, Joe studied for 3 more hours than Sarah.
If they studied a combined total of 7 hours, how many hours did Sarah study last night?

- A) 2 hours
- B) 2 hours 15 minutes
- C) 4 hours
- D) 1 hour 45 minutes

Written by Nicole D'Onofrio

Question 7

Pizza Sales at a Local Pizzeria

Serving	Type of Pizza				
	Cheese	Pepperoni	Vegetable	Sausage	Total
Single Slice	45	25	15	20	105
Whole	20	15	15	10	60
Total	65	40	30	30	165

The table above represents the 165 sales made at a local pizzeria in one day. The sales are categorized by type of pizza and whether a whole slice or pie was purchased. What proportion of the pizza sales were single slices of vegetable pizza?

- A) 15
- B) 24
- C) 16
- D) 11

Written by Nicole D'Onofrio

Question 8

Line l in the xy -plane contains points from Quadrants I and III, but no points from Quadrants II and IV. Which of the following must be true?

- A) The slope of line l is negative
- B) The slope of line l is 0
- C) Line l passes through point $(0,0)$
- D) Line l passes through point $(-1,0)$

Written by Nicole D'Onofrio

Question 9

Number of Books Read in an Elementary School, For a Book Report

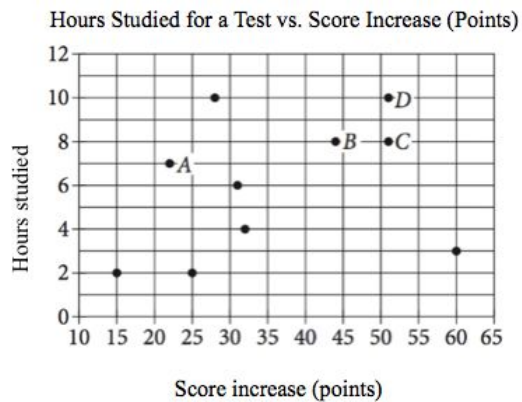
	Grade Level					
Genre	1st	2nd	3rd	4th	5th	Total
History	30	10	40	50	80	210
Realistic Fiction	60	100	100	80	60	400
Fantasy	80	60	50	40	60	290
Sci-Fi	40	40	20	40	10	150
Total	210	210	210	210	210	1050

The table above shows the number of students, by grade level, that chose either history, realistic fiction, fantasy, or science fiction for their book reports. If a student is chosen at random, from the 4th grade, which of the following is the probability that the student chose a fantasy novel?

- A) 5.25
- B) .19
- C) .72
- D) 40

Written by Nicole D'Onofrio

Question 10



The scatterplot above represents the relationship between the amount of hours students studied for a test versus their test score increases. How many hours did the student who had the highest test score increase, study?

- A) 3
- B) 10
- C) 2
- D) 5

Written by Nicole D'Onofrio

Question 11

Based on the above scatterplot, which student's ratio of hours studied to test score increase is about $1/5$?

- A) A
- B) B
- C) C
- D) D

Written by Nicole D'Onofrio

Question 12

In the xy -plane, the graph of a function has four x -intercepts. The x -intercepts are located at 4 and -2. Which of the following could define f ?

- A) $f(x) = (x - 2)(x + 4)$
- B) $f(x) = (x + 4)(x + 2)(x - 2)$
- C) $f(x) = (x - 4)(x + 2)$
- D) $f(x) = (x - 4)(x + 4)(x - 2)$

Written by Nicole D'Onofrio

Question 13

Time (Months)	Inventory (Products)
0	30
3	60
6	90
9	120
12	150

The best description for the above relationship between time (months) and inventory (products) is which of the following?

- A) None
- B) Linear
- C) Exponential
- D) Negative

Written by Nicole D'Onofrio

Question 14

$$p = 10w + 5$$

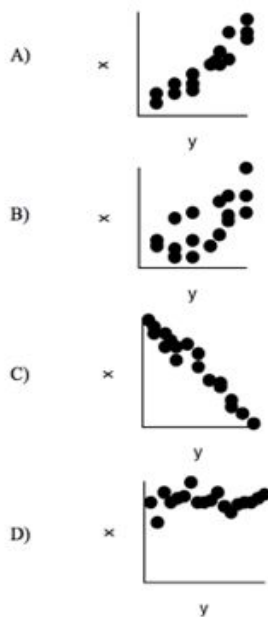
The expression above represents the amount of money, in dollars, Ryan gets paid each week at his job. The amount he gets paid is represented by p and the number of weeks he has worked is represented by w . Which of the following represents the amount of money Ryan made in the first two weeks?

- A) 40
- B) 20
- C) 15
- D) 25

Written by Nicole D'Onofrio

Question 15

The following scatterplots demonstrate different relationships between two variables, x and y . Which of the scatterplots demonstrates a relationship between x and y that is positive, linear, and strongly correlated?



Written by Nicole D'Onofrio

Question 16 and 17 refer to the following information:

A building rents out rooms for special events. The costs include a base fee of R and add-ons such as projectors, P , DVD players, D , and extension chords, E . Add-ons are costed per hour. The table below shows the cost of room rentals with add-ons for two different rooms.

	Room Rental Cost, R	Projector Cost, P	DVD Player Cost, D	Extension Chords, E
A	450	7	12	3
B	300	11	10	6

The total cost, y , for renting a room with add-ons is given by $y = R + (P + D + E)h$.

Question 16

For what number of hours, h , will the total room rental cost of Room A equal the rental cost of Room B?

- A) 31 hours
- B) 26.5 hours
- C) 12 hours
- D) 37.5 hours

Written by Nicole D'Onofrio

Question 17

When $h=12$, what does the sum of P , D , and E represent?

- A) The number of rental items at 12 hours.
- B) The base rental cost at 12 hours.
- C) The total cost to rent a room for 12 hours.
- D) The total cost of rental add-ons for 12 hours.

Written by Nicole D'Onofrio

Question 18

Sam makes a pitcher of lemonade that holds 282 cubic inches of lemonade. He has identical plastic cups to pour the lemonade into. The height of each cup is 8 inches and the diameter of each cup is 2 inches. If Sam fills each cup exactly half way, what is the maximum amount of cups he could fill with lemonade?

- A) 26
- B) 21
- C) 23
- D) 22

Written by Nicole D'Onofrio

Question 19

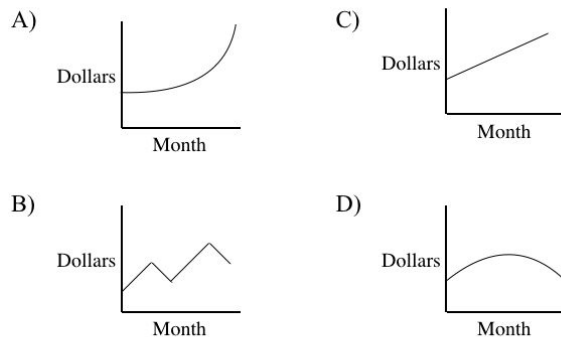
If $8r + 2t \leq 34$ and r is 2 less than t , what is the greatest possible value of t ?

- A) 6
- B) 3
- C) 5
- D) 2

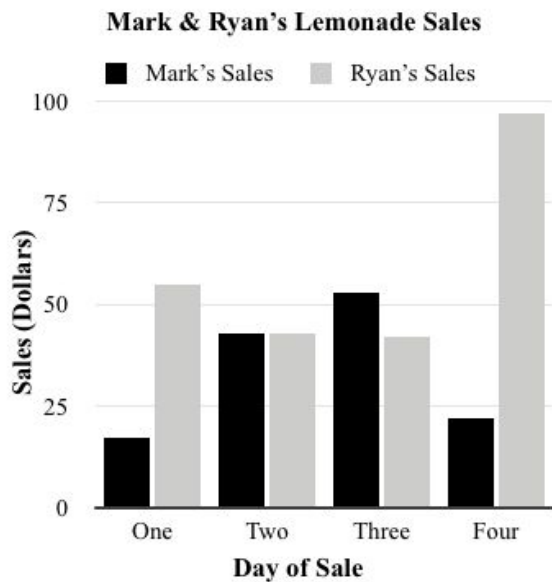
Written by Nicole D'Onofrio

Question 20

Brianna decides to start tracking her monthly cash flow in her bank account. She starts off with 100 dollars the first month and maintains this amount. The second month, she deposits 40 dollars. Each successive month, the amount Brianna deposits doubles. Which of the graphs below could model this situation?



Written by Nicole D'Onofrio



Mark and Ryan each start selling lemonade in front of a local supermarket. The bar graph above shows each of their sales, in dollars, over a period of four days.

Question 21

In a scatterplot of this data, where Mark's sales are represented on the x-axis and Ryan's sales are represented on the y-axis, how many data points would exist above the line $y = x$?

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

Written by Nicole D'Onofrio

Question 22

On the first day, how many more sales did Ryan make than Mark? *Express as a percent.*

- A) 50%
- B) 20%
- C) 5%
- D) 18%

Written by Nicole D'Onofrio

Question 23

The tables below give the distribution of inches of rain per day for City A and City B over the same 15 days in April.

City A (1.03) standard

Amount of Rain (Inches)	Frequency
5	0
4	2
3	4
2	5
1	4

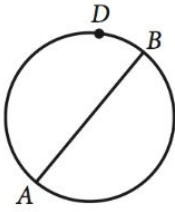
City B .9

Amount of Rain (Inches)	Frequency
5	3
4	5
3	5
2	2
1	0

Which of the following is true about the data shown for these 15 days?

- A) The standard deviation of rainfall in City A is larger.
- B) The standard deviation of rainfall in City B is larger.
- C) The standard deviation of rainfall in City A is the same as that of City B.
- D) The standard deviation of rainfall in these cities cannot be calculated with the data provided.

Written by Elise Favia

Question 24

In the circle above, segment AB is a diameter. If the length of arc ADB is 9π , what is the length of the radius of the circle?

- A) 3
- B) 6
- C) 9
- D) 18

Written by Elise Favia

Question 25

$$f(x) = 4x^2 + 5x + 6$$

$$g(x) = 2x^3 + 4x^2 + 4x + 3$$

The polynomials $f(x)$ and $f(g)$ are defined above. Which of the following is divisible by $x + 6$?

- A) $h(x) = 2(f(x)) + g(x)$
- B) $h(x) = 3(f(x)) - g(x)$
- C) $h(x) = 2(g(x)) + 1.5(f(x))$
- D) $h(x) = f(x) + g(x)$

Written by Nicole D'Onofrio

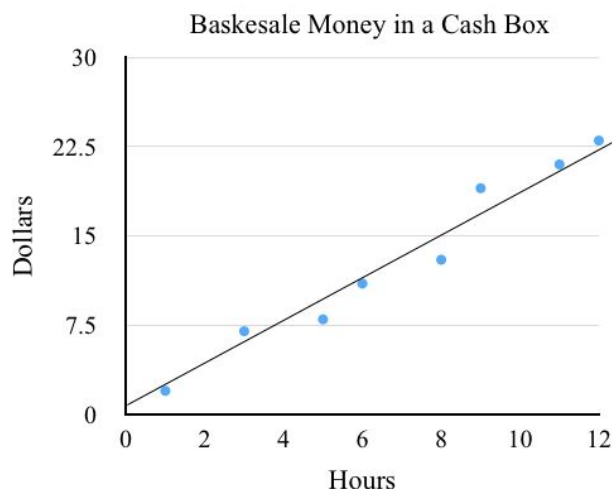
Question 26

Let a and b be numbers such that $-a < b < a$. Which of the following could be true if a is less than 4?

- A) $|b| = 5$
- B) $-a < -4$
- C) $b > 1$
- D) $a = 0$

Written by Nicole D'Onofrio

Question 27



The relative dollar amount, of money in a cash box, is defined by the expression *dollars / hours*.

The scatterplot above shows the total number of dollars in a cash box over the course of 12 hours at a local bakesale. The line of best fit for the scatterplot is $y = 1.9x + .09$. Which of the following statements accurately describes the equation?

- A) If 2 hours have passed, the bakesale has generated \$3.89 worth of revenue.
- B) The start amount of money in the cash box is \$1.90 and the end amount is 9 cents.
- C) The total amount of money generated at the end of each hour is 1.9 times the number of hours, less 9 cents.
- D) The total amount of money in the cash box, at any given moment, is 1.9 times the number of hours that have passed.

Written by Nicole D'Onofrio

Question 28

$$f(x) = (x + 3)(x - 5)$$

Which of the following is an equivalent form of the function f above in which the minimum value of f appears as a constant or coefficient?

- A) $f(x) = x^2 - 15$
- B) $f(x) = x^2 - 2x - 15$
- C) $f(x) = (x + 1)^2 - 16$
- D) $f(x) = (x - 1)^2 - 16$

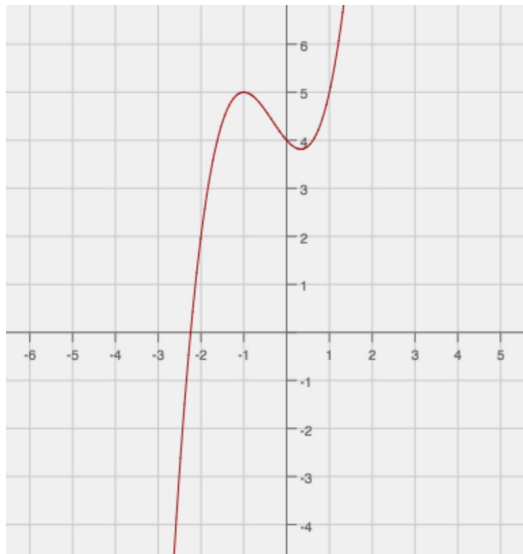
Written by Elise Favia

Question 29

If a is the mean of $2x$ and 6 , and b is the mean of $3x$ and 7 , and c is the mean of $5x$ and 13 , what is the average of a , b , and c , in terms of x .

- A) $x + 6$
- B) $6x + 1$
- C) $9 + 5x$
- D) $x + 5$

Written by Nicole D'Onofrio

Question 30

30. The function $f(x) = x^3 + x^2 - x + 4$ is graphed in the xy -plane above. If k is a constant such that the equation $f(x) = k$ has two real solutions, which of the following could be the value of k ?

- A) -2
- B) 4
- C) 5
- D) 0

Written by Elise Favia

Question 31

A specific bathtub can hold up to 50 gallons of water. If the bathtub already holds 5 gallons of water and the faucet is pouring out 3 gallons per minute, after how many more minutes will the bathtub be full?

Written by Nicole D'Onofrio

Question 32

Tracy earns a flat rate of 16 dollars an hour at her new job. For each sale she makes, s , she receives an additional sales commission of 4 dollars. The amount of money she makes in one hour can be modeled by the equation $D = 16 + 4s$. If a quarter of Tracy's earnings are used to pay for monthly expenses, how much of her earnings (per hour) does she get to keep if she makes 17 sales?

Written by Nicole D'Onofrio

Question 33

The *nic* is a unit of measurement that is equal to 12 *ole's*. If 15 *ole's* are equal to one foot, how many *nic's* are in 2 feet. (*Do not round*).

Written by Nicole D'Onofrio

Question 34

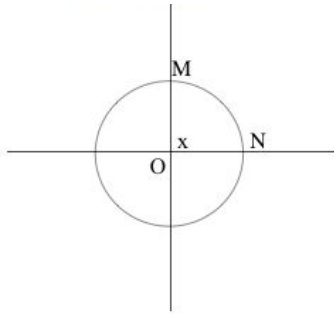
A company currently has 16 male employees and 19 female employees. Recently, 3 female employees quit and the number of male employees increased by 25%. What is the new percentage of employees that are male? (*Round to the nearest whole percent*).

Written by Nicole D'Onofrio

Question 35

$$E_k = .5mv^2$$

The kinetic energy, E , of a non-rotating object of mass, m , traveling at a speed, v , can be found using the formula above. A professor uses the formula above to find the kinetic energy of an object of mass, m , moving at a speed, v , and another object of mass, $2m$, moving at a speed $1.5v$. What is the ratio of the kinetic energy of the faster object to the kinetic energy of the slower object?

Question 36

In the figure above, the circle has a center at O and has a radius of 7. The angle x is 45. What is the length of Arc MN, opposite of angle x . (Round to the nearest 10th place).

Questions 37 and 38 refer to the following information.

A company owns a piece of equipment worth \$8,000.
An account predicts that the equipment will depreciate at a rate of 14% per year. The accountant uses the equation $E = 8,000(r)^y$ to model the equipment value, E , after y years.

Question 37

What value should the accountant use for r ?
Answer = .86

Question 38

To the nearest dollar, what is the value of the equipment at the end of 5 years?
Answer: 3763

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