



MATHS

BOOKS - KAPLAN INC MATHS (ENGLISH)

MATH TEST -02

Multiple Choice Question

1. Oceans seas, and bays represent about 96.5% of Earth's including the water found in

our atmosphere. If the volume of the water contained in oceans, seas, and bays is about 3221, 000, 000 cubic miles, which of the following best represents the approximate volume, in cubic miles, of all the world's water?

A. 308, 160, 000

B. 309, 765, 000

C. 332, 642, 000

D. 334,375,000

Answer: C



2. An electrician charges a one-time site visit free to evaluate a potential job. If the electrician accepts the job, he charges an hourly rate plus the cost of any materials needed to complete the job. The electrician also charges for tax, but only on the cost of the materials. If the total cost of completing a job that takes h hours is given by the function $C(h) = 45h + 1.06(82.5) + 75$, then the term $1.06(82.5)$ represents

A. the hourly rate

B. the site visit fee

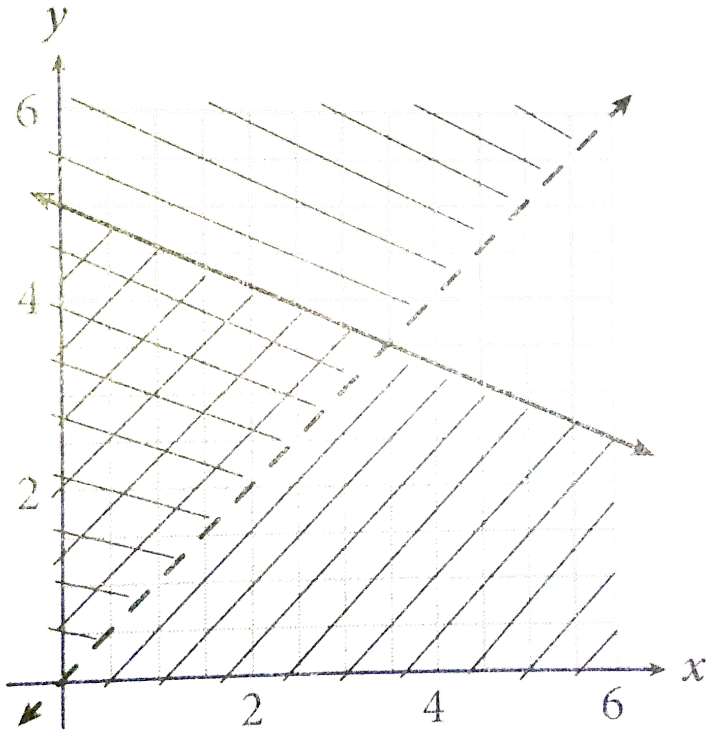
C. the cost of the materials, including tax

D. the cost of the material, not including
tax

Answer: C



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3.

The figure above shows the solution for the

system $\begin{cases} y > x \\ y \leq \frac{-3}{7}x + 5 \end{cases}$. Which of the

following is not a solution to the system?

A. $(0, 3)$

B. (1, 2)

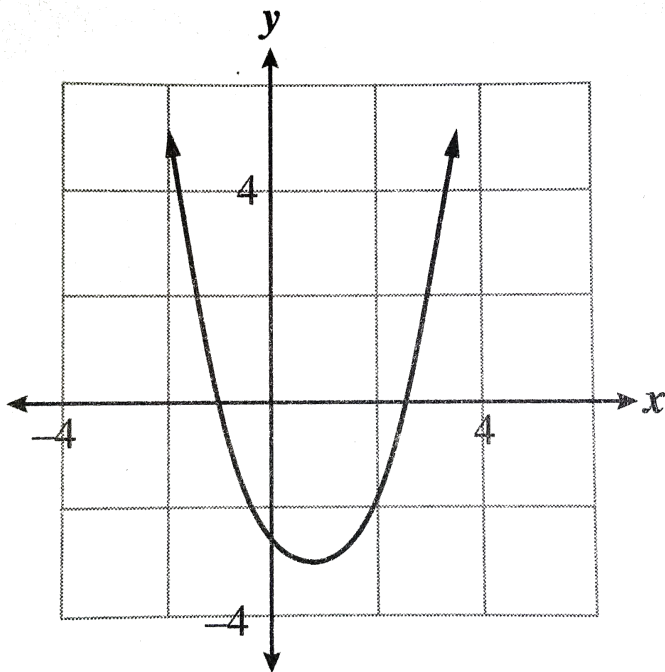
C. (2, 4)

D. (3, 3)

Answer: D



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4.

Each of the following quadratic equations represents the graph shown above. Which equation reveals the exact values of the x-intercepts of the graph?

A. $y = \frac{1}{2}(2x - 5)(x + 1)$

$$\text{B. } y = x^2 - \frac{3}{2}x + \frac{5}{2}$$

$$\text{C. } y + \frac{49}{16} = \left(x - \frac{3}{4}\right)^2$$

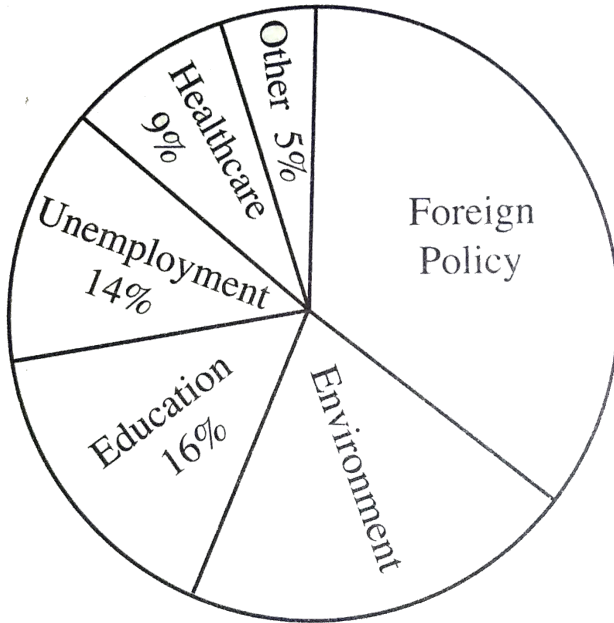
$$\text{D. } y = \left(x - \frac{3}{4}\right)^2 - \frac{49}{16}$$

Answer: A



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National Government Concerns



5.

Margo surveyed all the students in the government classes at her school to see what they thought should be the most important concern of a national government. The result of the survey are shown in the figure above. If

the ratio of students who answered "Foreign Policy" to those who answered "Environment" was 5:3, what percentage of the students answered "Environment"?

A. 16 %

B. 21 %

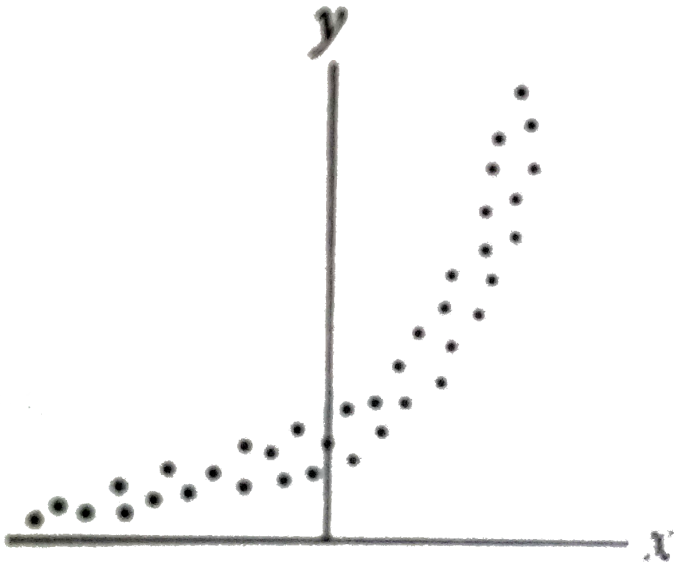
C. 24 %

D. 35 %

Answer: B



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6.

Which of the following best describes the type of association shown in the scatterplot above?

- A. Linear, positive
- B. Linear, negative

C. Exponential, positive

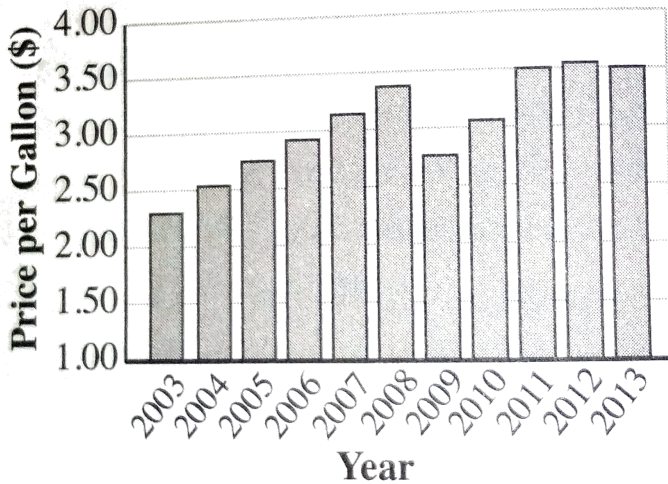
D. Exponential, negative

Answer: C



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Average Annual Gas Prices



Data from U.S. Energy Information Administration.

7.

The figure above shows the average annual gas prices in the United States from 2003 to 2013. Based on the information shown, which of the following conclusions is valid?

- A. A gallon of gas cost more in 2008 than in 2013
- B. The price more than doubled between 2003 and 2013
- C. The drop in price from 2008 to 2009 was more than \$1.00 per gallon.
- D. The overall change in price was together between 2003 and 2008 than it was between 2008 and 2013.

Answer: D



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8. $\{(-2x+5y=1), (7x-10y=-11)\}$

If (x,y) is a solution to the system of equations above, what is the sum of x and y ?

A. $-\frac{137}{30}$

B. -4

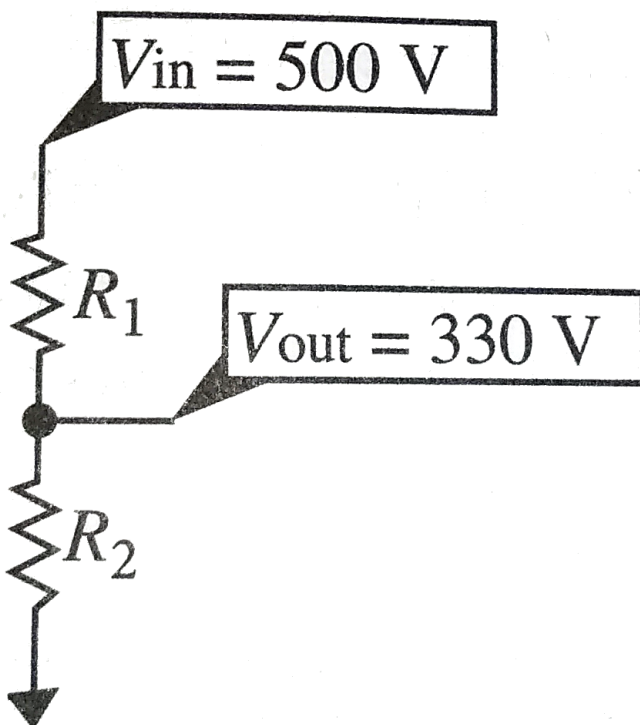
C. $-\frac{10}{3}$

D. -3

Answer: B



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9.

A voltage divider is a simple circuit that converts a large voltage into a smaller one. The figure

above shows a voltage divider that consists of two resistors that together have a total resistance of 294 ohms. To produce the desired voltage of 330 volts, R_2 must be 6 ohms less than twice R_1 . Solving which of the following systems of equations gives the individual resistance for R_1 and R_2 ?

A.
$$\begin{cases} R_2 = 2R_1 - 6 \\ R_1 + R_2 = 294 \end{cases}$$

B.
$$\begin{cases} R_2 = 2R_1 + 6 \\ R_1 + R_2 = 294 \end{cases}$$

C.
$$\begin{cases} R_2 = 2R_1 - 6 \\ R_1 + R_2 = \frac{294}{300} \end{cases}$$

D.
$$\begin{cases} R_2 = 2R_1 + 6 \\ R_1 + R_2 = 294(300) \end{cases}$$

Answer: A



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10.

if

$$(2) / (5)(5x) + 2(x - 1) = 4(x + 1) - 2,$$

what is the value of x ?

A. $x = -2$

B. $x = 2$

C. There is no value of x for which the equation is true

D. There are infinitely many values of x for which the equation is true

Answer: C



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11. Crude oil is being transferred from a full rectangular storage container with dimensions of 4 meters by 9 meters by 10 meters into cylinders transportation container that has a diameter of 6 meters. What is the

minimum possible length for transportation
container that will hold all of the oil?

A. 40π

B. $\frac{40}{\pi}$

C. 60π

D. $\frac{120}{\pi}$

Answer: B



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12. The percent increase from 5 to 12 is equal to the percent increase from 12 to what number?

A. 16.8

B. 19.0

C. 26.6

D. 28.8

Answer: D



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$$13. b = \frac{L}{4\pi d^2}$$

The brightness of a celestial body, like a star decrease as you move away from it. In contrast, the luminosity of a celestial body is a constant number that represents its intrinsic brightness. The inverse square law, shown above, is used to find the brightness, b , of a celestial body when you know its luminosity, L , and the distance, d , in meters to the body. Which equation shows the distance to a celestial body, given its brightness and luminosity?

$$\text{A. } d = \frac{1}{2} \sqrt{\frac{L}{\pi b}}$$

$$\text{B. } d = \sqrt{\frac{L}{2\pi b}}$$

$$\text{C. } d = \frac{\sqrt{L}}{2\pi b}$$

$$\text{D. } d = \frac{L}{2\sqrt{\pi b}}$$

Answer: A



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14. Each month, The Bureau of Labor Statistics conducts a survey called the Current Population Survey (CPS) to measure

unemployment in the United States. Across the country, about 60,000 households are included in the survey sample. These households are grouped by geographic region. A summary of the January 2014 survey results for male respondents in one geographical region is shown in the table below.

Age Group	Employed	Unemployed	Not in the Labor Force	Total
16 to 19	8	5	10	23
20 to 24	26	7	23	56
25 to 34	142	11	28	157
35 to 44	144	8	32	164
45 to 54	66	6	26	98
Over 54	65	7	36	152
Total	451	44	155	650

Q. According to data in the table, for which age group did the smallest percentage of men

report that they were unemployed in January 2014?

A. 20 to 24 years

B. 35 to 44 years

C. 45 to 54 years

D. Over 54 years

Answer: D



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15. Each month. The Bureau of Labor Statistics conducts a survey called the Current Population Survey (CPS) to measure unemployment in the United States. Across the country, about 60,000 households are included in the survey sample. These households are grouped by geographic region. A summary of the January 2014 survey results for one geographical region is shown in the table below.

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45 to 54	66	6	26	98
Over 54	65	7	36	152
Total	451	44	155	650

Q. If one unemployed man from this sample is chosen at random for a follow-up survey, what is the probability that he will be between the ages of 45 to 54?

A. 6.0 %

B. 13.6 %

C. 15.1 %

D. 44.6 %

Answer: B



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16. Which of the following are solutions to the quadratic equation $(x - 1)^2 - \frac{4}{9}$?

A. $x = -\frac{5}{3}, x = \frac{5}{3}$

B. $x = \frac{1}{3}, x = \frac{5}{3}$

C. $x = \frac{5}{9}, x = \frac{13}{9}$

D. $x = 1 \pm \sqrt{\frac{2}{3}}$

Answer: B



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17. Damien is throwing darts. He has total of 6 darts to throw. He gets 5 points for each dart that lands in a blue ring and 10 point for each dart that lands in a red ring. If x of his darts land in a blue ring and the rest land in a red ring, which expression represents his total score?

A. $10x$

B. $10x + 5$

C. $5x + 30$

D. $60 - 5x$

Answer: D



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18. Red tides is a form of harmful algae that release toxins as it breaks down in the environment. A marine biologist is testing a new spray, composed of clay and water, hoping to kill the red tide that almost completely covers a beach in southern Florida. He applies the spray to a representative sample of 200 square feet of the beach. By the end of the

week, 184 square feet of the beach is free of the red tide. Based on these results, and assuming the same general conditions, how much of the 10,000-squarefoot beach would still be covered by red tide if the spray had been used on the entire area?

- A. 800 sq ft
- B. 920 sq ft
- C. 8,000 sq ft
- D. 9,200 sq ft

Answer: A



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19. $\{(y = \frac{1}{2}x - 2), (y = -x^2 + 1)\}$

If (a, b) is a solution to the system of equations above, which of the following could be the value of b ?

A. -3

B. -2

C. 1

D. 2

Answer: A



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20. Given the function $g(x) = \frac{2}{3}x + 7$, what domain value corresponds to a range value of 3?

A. -6

B. -2

C. 6

D. 9

Answer: A



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21. A landscaper buys a new commercial-grade lawn mower that costs \$2,800. Based on past experience, he expects it to last about 8 years, and then he can sell it for scrap metal with salvage value of about \$240. Assuming the value of the lawn mower depreciates at a constant rate, which equation could be used

to find its approximate value after x years,
given that $x < 8$?

A. $y = -8x + 2,560$

B. $y = -240x + 2,800$

C. $y = -320x + 2,800$

D. $y = 240x - 2,560$

Answer: C



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22. A microbiologist is studying the effects of a new antibiotic on a culture of 20,000 bacteria. When the antibiotic is added to the culture, the number of bacteria is reduced by half every. What kind of function best models the number of bacteria remaining in the culture after the antibiotic is added?

- A. A linear function
- B. A quadratic function
- C. A polynomial function

D. An exponential function

Answer: D



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23. An airline company purchased two new airplanes. One can travel at speeds of up to 600 miles per hour and the other at speeds of up to 720 miles per hour. How many more miles can the faster airplane travel in 12 seconds than the slower airplane?

A. $\frac{1}{30}$

B. $\frac{2}{5}$

C. 2

D. 30

Answer: B



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State	Minimum Wage per Hour
Idaho	\$7.25
Montana	\$7.90
Oregon	\$9.10
Washington	\$9.32

24.

The table above shows the 2014 minimum wages for several states that share a border. Assuming an average workweek of between 35 and 40 hours, which inequality represents how much more a worker who earns minimum wage can earn per week in Oregon than in Idaho?

A. $x \geq 1.85$

B. $7.25 \leq x \leq 9.10$

C. $64.75 \leq x \leq 74$

D. $253.75 \leq x \leq 364$

Answer: C



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25. In the United States, the maintenance and construction of airports, transit systems, and major roads are largely funded through a federal excise tax on gasoline. Based on the

2011 statistics given below, how much did the average house hold pay per year in federal gasoline taxes?

* The federal gasoline tax rate was 18.4 cents per gallon.

* The average motor vehicles was driven approximately 11,340 miles per year.

* The national average fuel economy for noncommercial vehicles was 21.4 miles per gallon.

* The average American household owned 1.75 vehicles.

A. 55.73

B. 68.91

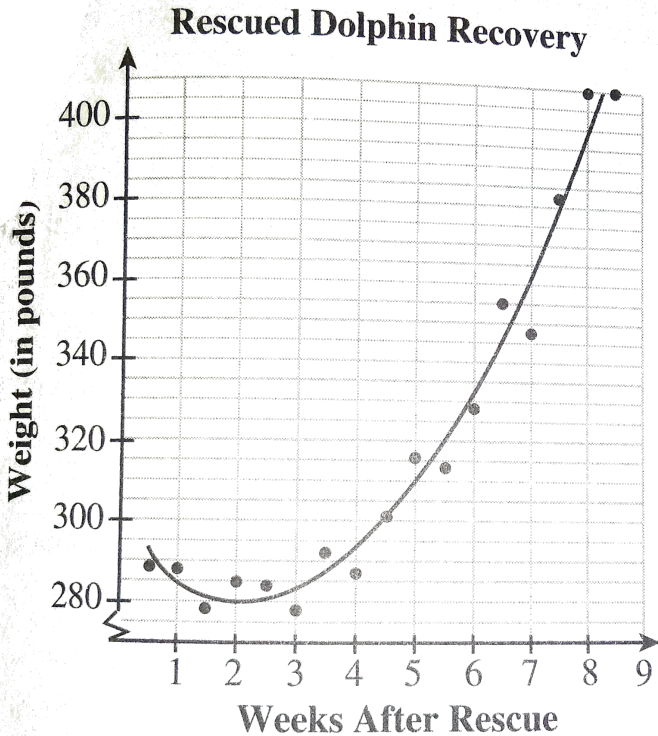
C. 97.52

D. 170.63

Answer: D



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26.

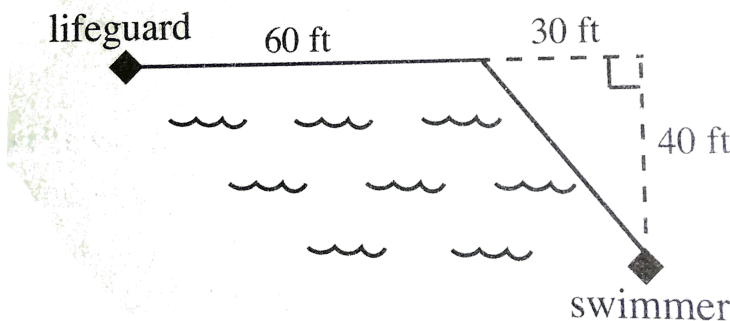
Following the catastrophic oil spill in the Gulf of Mexico in April of 2010, more than 900 bottlenose dolphins were found dead or stranded in the oil spill area. The figure above shows the weight of a rescued dolphin during

its recovery. Based on the quadratic model fit to the data shown, which of the following is the closest to the average rate of change in the dolphin's weight between week 2 and week 8 of its recovery?

- A. 4 pounds per week
- B. 16 pounds per week
- C. 20 pounds per week
- D. 40 pounds per week

Answer: C





27.

As shown in the figure above, a lifeguard sees a struggling swimmer who is 40 feet from the beach. The lifeguard runs 60 feet along the edge of the water at a speed of 12 feet per second. He pauses for 1 seconds to locate the swimmer again, and then dives into the water

and swims along a diagonal path to the swimmer at a speed of 5 feet per second. How many seconds go by between the time the lifeguard sees the struggling swimmer and the times he reaches the swimmer?

A. 16

B. 22

C. 50

D. 56

Answer: A



28. What was the initial amount of gasoline in a fuel trailer, in gallons, if there are now x gallons, y gallons were pumped into a storage tank, and then 50 gallons were added to the trailer?

A. $x + y + 50$

B. $x + y - 50$

C. $y - x + 50$

D. $x - y - 50$

Answer: B



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$$29. \frac{3.86}{x} + \frac{180.2}{10x} + \frac{42.2}{5x}$$

The Ironman Triathlon originated in Hawaii in 1978. The format of the Ironman has not changed since then: It consists of a 3.86-km swim, a 180.2-km bicycle ride, and a 42.2-km run, all raced in that order and without a break. Suppose an athlete bikes 10 times as fast as he swims and runs 5 times as fast as he

swims. The variable x in the expression above represents the rate at which the athlete swims, and the whole expression represents the number of hours that it takes him to complete the race. If it takes him 16.2 hours to complete the race, how many kilometers did he swim in 1 hour?

A. 0.85

B. 1.01

C. 1.17

D. 1.87

Answer: D



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30. What value of x satisfies the equation

$$\frac{2}{3}(5x + 7) = 8x?$$



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31. Some doctors base the dosage of a drug to be given to a patient on the patient's body surface area (BSA). The most commonly used

formula for calculating BSA is

$$BSA = \sqrt{\frac{wh}{3,600}}$$

where w is the patient's weight

(in kg), h is the patient's height (in cm), and

BSA is measured in square meters. How tall (in

cm) is a patient who weighs 150kg and has a

BSA of $2\sqrt{2}m^2$?



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32. A collage math professor informs her students that rather than curving final grades, she will replace each student's lowest test

score with the next ot lowest test score, and then re-average the rest grades. If Leeza has test scores of 86, 92, 81, 64, and 83, by how many points does her final test average change based on the professor's policy?



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33. If the slope of line is $-\frac{7}{4}$ and a point on the line is $(4, 7)$, what is the y-intercept of the line?



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34. Rory left home and drove straight to the airport at an average speed of 45 miles per hour. He returned home along the same route, but traffic slowed him down and he only averaged 30 miles per hour on the return trip. If his total travel time was 2 hours and 30 minutes, how far is it, in miles, from Rory's house to the airport?



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Chemical Makeup of One Mole of Chloroform

Element	Number of Moles	Mass per Mole (grams)
Carbon	1	12.011
Hydrogen	1	1.008
Chlorine	3	35.453

35.

A chemical solvent is a substance that dissolves another to form a solution. For example, water is a solvent for sugar. Unfortunately, many chemical solvents are hazardous to the environment. One eco-friendly chemical solvent is chloroform, also known as trichloromethane ($CHCl_3$). The table above shows the chemical makeup of one mole of chloroform.

Q. Carbon makes up what percent of the mass

of one mole of chloroform? Round your answer to the nearest whole percent and ignore the percent sign when entering your answer.



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Chemical Makeup of One Mole of Chloroform

Element	Number of Moles	Mass per Mole (grams)
Carbon	1	12.011
Hydrogen	1	1.008
Chlorine	3	35.453

36.

A chemical solvent is a substance that dissolves another to form a solution. For example, water is a solvent for sugar. Unfortunately, many chemical solvents are

hazardous to the environment. One eco-friendly chemical solvent is chloroform, also known as trichloromethane ($CHCl_3$). The table above shows the chemical makeup of one mole of chloroform.

Q. If a chemist starts with 1,000 grams chloroform and uses 522.5 grams, how many moles of chlorine are left?



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