PrepBox

SAT Math Practice

Workbook Instructions

1 Make sure to watch the lecture videos

Accompanying lectures for questions 1 - 5

Scan for lecture videos

2 Review your mistakes using solution videos

Question 3: Add.

$$\frac{7}{10}+\frac{4}{6}$$

Solution Video

Scan for solution videos

Table of Contents

Practice Tests from College Board

Practice Test #1 - No Calculator Section

Accompanying lectures for questions 1 - 1

Question 1: If $\frac{x-1}{3} = k$ and $k = 3$, what is the value of x?

A) 2

B) 4

C) 9

D) 10

Solution Video

Accompanying lectures for questions 2 - 2

Question 2: For $i = \sqrt{-1}$, what is the sum $(7 + 3i) + (-8 + 9i)$?

A) $-1 + 12i$

B) $-1 - 6i$

C) $15 + 12i$

D) $15 - 6i$

Solution Video

Accompanying lectures for questions 3 - 3

Question 3: On Saturday afternoon, Armand sent m text messages each hour for 5 hours, and Tyrone sent p text messages each hour for 4 hours. Which of the following represents the total number of messages sent by Armand and Tyrone on Saturday afternoon?

A) $9mp$

B) 20mp

C) $5m + 4p$

D) $4m + 5p$

Solution Video

Accompanying lectures for questions 4 - 4

Question 4: Kathy is a repair technician for a phone company. Each week, she receives a batch of phones that need repairs. The number of phones that she has left to fix at the end of each day can be estimated with the equation $P = 108 - 23d$, where P is the number of phones left and d is the number of days she has worked that week. What is the meaning of the value 108 in this equation?

A) Kathy will complete the repairs within 108 days.

B) Kathy starts each week with 108 phones to fix.

C) Kathy repairs phones at a rate of 108 per hour.

D) Kathy repairs phones at a rate of 108 per day.

Solution Video

Accompanying lectures for questions 5 - 5

Question 5: $\left(x^2y - 3y^2 + 5xy^2\right) - \left(-x^2y + 3xy^2 - 3y^2\right)$

Which of the following is equivalent to the expression above?

A) $4x^2y^2$

B) $8xy^2 - 6y^2$

C) $2x^2y + 2xy^2$

D) $2x^2y + 8xy^2 - 6y^2$

Solution Video

Accompanying lectures for questions 6 - 6

Question 6: $h = 3a + 28.6$

A pediatrician uses the model above to estimate the height h of a boy, in inches, in terms of the boy's age a, in years, between the ages of 2 and 5. Based on the model, what is the estimated increase, in inches, of a boy's height each year?

A) 3

B) 5.7

C) 9.5

D) 14.3

Solution Video

Accompanying lectures for questions 7 - 7

Question 7: $m = \dfrac{\left(\frac{r}{1{,}200}\right)\left(1+\frac{r}{1{,}200}\right)^{N}}{\left(1+\frac{r}{1{,}200}\right)^{N}-1}P$

The formula above gives the monthly payment m needed to pay off a loan of P dollars at r percent annual interest over N months. Which of the following gives P in terms of m, r, and N?

A) $P = \dfrac{\left(\frac{r}{1{,}200}\right)\left(1+\frac{r}{1{,}200}\right)^{N}}{\left(1+\frac{r}{1{,}200}\right)^{N}-1}m$

B) $P = \dfrac{\left(1+\frac{r}{1{,}200}\right)^{N}-1}{\left(\frac{r}{1{,}200}\right)\left(1+\frac{r}{1{,}200}\right)^{N}}m$

C) $P = \left(\dfrac{r}{1,200}\right)m$

D) $P = \left(\dfrac{1,200}{r}\right)m$

Solution Video

Accompanying lectures for questions 8 - 8

Question 8: If $\frac{a}{b} = 2$, what is the value of $\frac{4b}{a}$?

A) 0

B) 1

C) 2

D) 4

Solution Video

Accompanying lectures for questions 9 - 9

Question 9:

$$\begin{aligned} 3x + 4y &= -23 \\ 2y - x &= -19 \end{aligned}$$

What is the solution (x, y) to the system of equations above?

A) $(-5, -2)$

B) $(3, -8)$

C) $(4, -6)$

D) $(9, -6)$

Solution Video

Accompanying lectures for questions 10 - 10

Question 10: $g(x) = ax^2 + 24$

For the function g defined above, a is a constant and $g(4) = 8$. What is the value of $g(-4)$?

A) 8

B) 0

C) -1

D) -8

Solution Video

Accompanying lectures for questions 11 - 11

Question 11:

$$b = 2.35 + 0.25x$$
$$c = 1.75 + 0.40x$$

In the equations above, b and c represent the price per pound, in dollars, of beef and chicken, respectively, x weeks after July 1 during last summer. What was the price per pound of beef when it was equal to the price per pound of chicken?

A) $\$2.60$

B) $\$2.85$

C) $\$2.95$

D) $\$3.35$

Solution Video

Accompanying lectures for questions 12 - 12

Question 12: A line in the xy-plane passes through the origin and has a slope of $\frac{1}{7}$. Which of the following points lies on the line?

A) $(0, 7)$

B) $(1, 7)$

C) $(7, 7)$

D) $(14, 2)$

Solution Video

Accompanying lectures for questions 13 - 13

Question 13: If $x > 3$, which of the following is equivalent to $\dfrac{1}{\frac{1}{x+2} + \frac{1}{x+3}}$?

A) $\dfrac{2x+5}{x^2+5x+6}$

B) $\dfrac{x^2+5x+6}{2x+5}$

C) $2x+5$

D) x^2+5x+6

Solution Video

Accompanying lectures for questions 14 - 14

Question 14: If $3x - y = 12$, what is the value of $\frac{8^x}{2^y}$?

A) 2^{12}

B) 4^4

C) 8^2

D) The value cannot be determined from the information given.

Solution Video

Accompanying lectures for questions 15 - 15

Question 15: If $(ax+2)(bx+7)=15x^2+cx+14$ for all values of x, and $a+b=8$, what are the two possible values for c ?

A) 3 and 5

B) 6 and 35

C) 10 and 21

D) 31 and 41

Solution Video

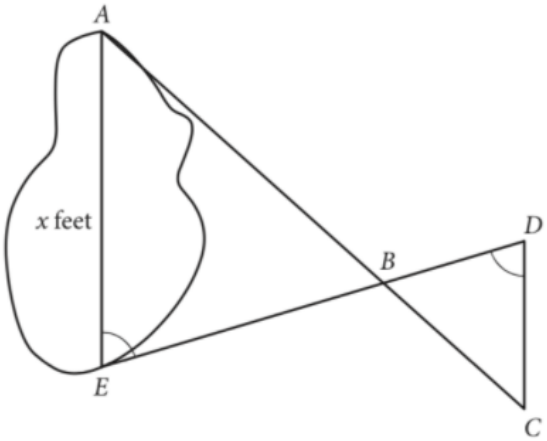
Accompanying lectures for questions 16 - 16

Question 16: If $t > 0$ and $t^2 - 4 = 0$, what is the value of t ?

Solution Video

Accompanying lectures for questions 17 - 17

Question 17: A summer camp counselor wants to find a length, x, in feet, across a lake as represented in the sketch above. The lengths represented by AB, EB, BD, and CD on the sketch were determined to be 1800 feet, 1400 feet, 700 feet, and 800 feet, respectively. Segments AC and DE intersect at B, and $\angle AEB$ and $\angle CDB$ have the same measure. What is the value of x ?



Solution Video

Accompanying lectures for questions 18 - 18

Question 18:

$$x + y = -9$$
$$x + 2y = -25$$

According to the system of equations above, what is the value of x ?

Solution Video

Accompanying lectures for questions 19 - 19

Question 19: In a right triangle, one angle measures x°, where $\sin x^\circ = \frac{4}{5}$. What is $\cos\left(90^\circ - x^\circ\right)$?

Solution Video

Accompanying lectures for questions 20 - 20

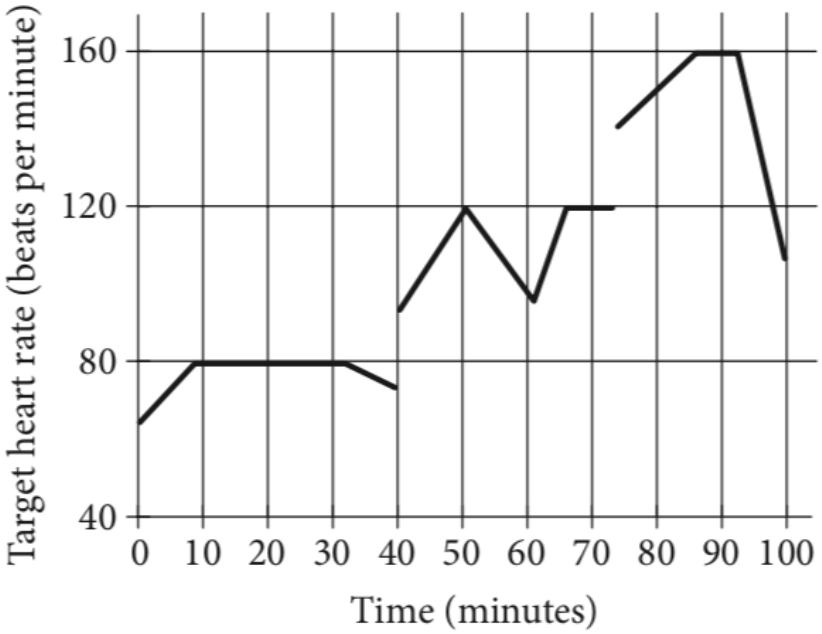
Question 20: If $a = 5\sqrt{2}$ and $2a = \sqrt{2x}$, what is the value of x ?

Solution Video

Practice Test #1 - Calculator Section

Accompanying lectures for questions 21 - 23

Question 21: John runs at different speeds as part of his training program. The graph shows his target heart rate at different times during his workout. On which interval is the target heart rate strictly increasing then strictly decreasing?



A) Between 0 and 30 minutes

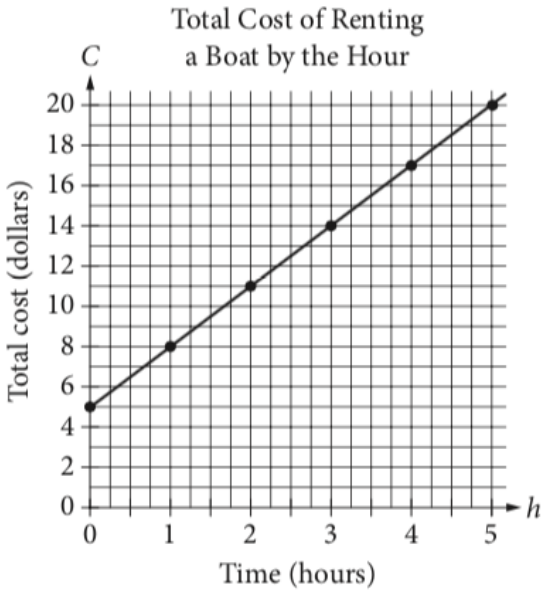
B) Between 40 and 60 minutes

C) Between 50 and 65 minutes

D) Between 70 and 90 minutes

Solution Video

Question 22:



The graph above displays the total cost C , in dollars, of renting a boat for h hours.

What does the C -intercept represent in the graph?

A) The initial cost of renting the boat

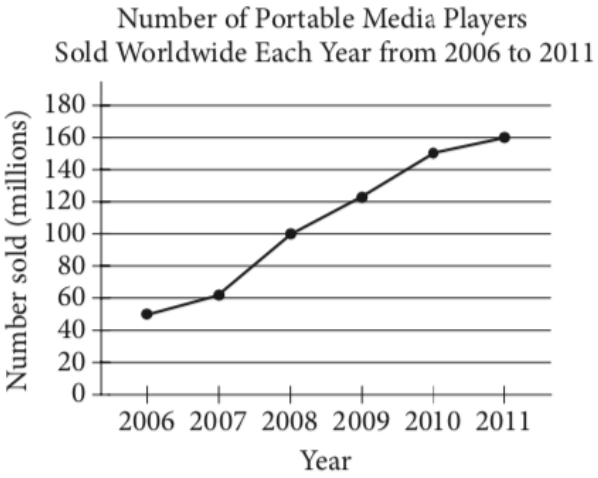
B) The total number of boats rented

C) The total number of hours the boat is rented

D) The increase in cost to rent the boat for each additional hour

Solution Video

Question 23: According to the line graph above, the number of portable media players sold in 2008 is what fraction of the number sold in 2011 ?



Solution Video

Accompanying lectures for questions 24 - 24

Question 24: If $y = kx$, where k is a constant, and $y = 24$ when $x = 6$, what is the value of y when $x = 5$?

A) 6

B) 15

C) 20

D) 23

Solution Video

Accompanying lectures for questions 25 - 25

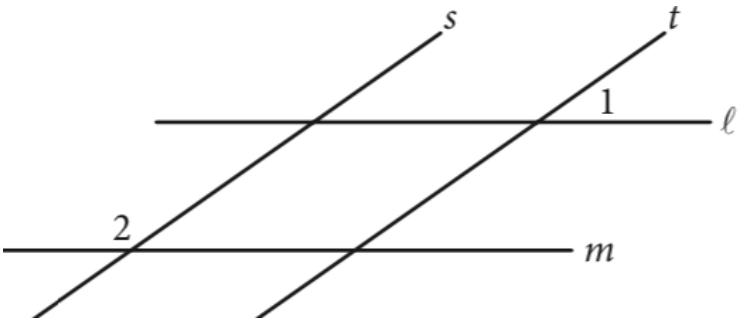
Question 25: In the figure above, lines ℓ and m are parallel and lines s and t are parallel. If the measure of $\angle 1$ is 35°, what is the measure of $\angle 2$?

A) 35°

B) 55°

C) 70°

D) 145°



Solution Video

Accompanying lectures for questions 26 - 26

Question 26: If $16 + 4x$ is 10 more than 14, what is the value of $8x$?

A) 2

B) 6

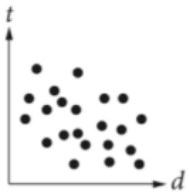
C) 16

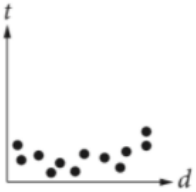
D) 80

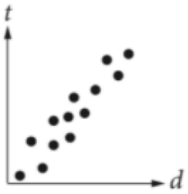
Solution Video

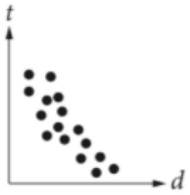
Accompanying lectures for questions 27 - 27

Question 27: Which of the following graphs best shows a strong negative association between d and t ?

A) 

B) 

C) 

D) 

Solution Video

Accompanying lectures for questions 28 - 28

Question 28:

$$\begin{aligned} 1 \text{ decagram} &= 10 \text{ grams} \\ 1,000 \text{ milligrams} &= 1 \text{ gram} \end{aligned}$$

A hospital stores one type of medicine in 2 -decagram containers. Based on the information given in the box above, how many 1-milligram doses are there in one 2 -decagram container?

A) 0.002

B) 200

C) $2,000$

D) $20,000$

Solution Video

Accompanying lectures for questions 29 - 36

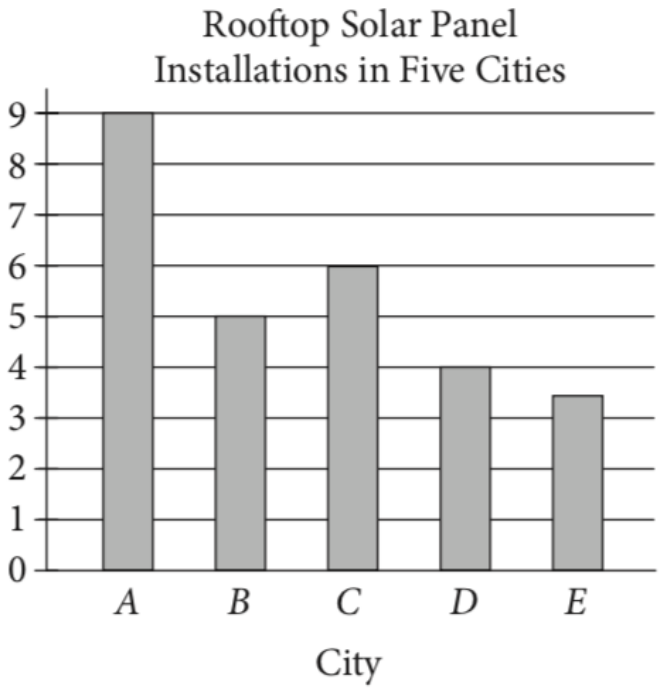
Question 29: The number of rooftops with solar panel installations in 5 cities is shown in the graph above. If the total number of installations is 27,500 , what is an appropriate label for the vertical axis of the graph?

A) Number of installations (in tens)

B) Number of installations (in hundreds)

C) Number of installations (in thousands)

D) Number of installations (in tens of thousands)



Solution Video

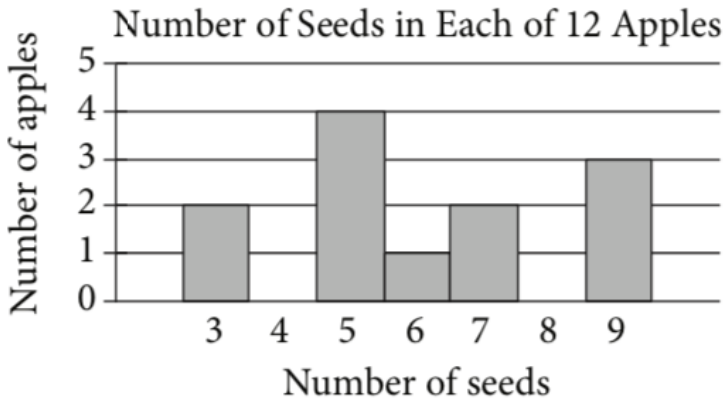
Question 30: Based on the histogram above, of the following, which is closest to the average (arithmetic mean) number of seeds per apple?

A) 4

B) 5

C) 6

D) 7



Solution Video

Question 31:

	$AlgebraI$	$Geometry$	$AlgebraII$	$Total$
$Female$	35	53	62	150
$Male$	44	59	57	160
$Total$	79	112	119	310

A group of tenth-grade students responded to a survey that asked which math course they were currently enrolled in. The survey data were broken down as shown in the table above. Which of the following categories accounts for approximately 19 percent of all the survey respondents?

A) Females taking Geometry

B) Females taking Algebra II

C) Males taking Geometry

D) Males taking Algebra I

Solution Video

Accompanying lectures for questions 29 - 36

Question 32: Lengths of Fish (in inches)

8	9	9	9	10	10	11
11	12	12	12	12	13	13
13	14	14	15	15	16	24

The table above lists the lengths, to the nearest inch, of a random sample of 21 brown bullhead fish. The outlier measurement of 24 inches is an error. Of the mean, median, and range of the values listed, which will change the most if the 24 -inch measurement is removed from the data?

A) Mean

B) Median

C) Range

D) They will all change by the same amount.

Solution Video

Question 33: Dreams Recalled during One Week

	$None$	$1to4$	$5ormore$	$Total$
$GroupX$	15	28	57	100
$GroupY$	21	11	68	100
$Total$	36	39	125	200

The data in the table above were produced by a sleep researcher studying the number of dreams people recall when asked to record their dreams for one week. Group X consisted of 100 people who observed early bedtimes, and Group Y consisted of 100 people who observed later bedtimes. If a person is chosen at random from those who recalled at least 1 dream, what is the probability that the person belonged to Group Y ?

A) $\frac{68}{100}$

B) $\frac{79}{100}$

C) $\frac{79}{164}$

D) $\frac{164}{200}$

Solution Video

Question 34: Which of the following best approximates the average rate of change in the annual budget for agriculture/natural resources in Kansas from 2008 to 2010?

A) $\$50,000,000$ per year

B) $\$65,000,000$ per year

C) $\$75,000,000$ per year

D) $\$130,000,000$ per year

Program	*Year*			
	2007	2008	2009	2010
Agriculture/natural resources	373,904	358,708	485,807	488,106
Education	2,164,607	2,413,984	2,274,514	3,008,036
General government	14,347,325	12,554,845	10,392,107	14,716,155
Highways and transportation	1,468,482	1,665,636	1,539,480	1,773,893
Human resources	4,051,050	4,099,067	4,618,444	5,921,379
Public safety	263,463	398,326	355,935	464,233

The table above lists the annual budget, in thousands of dollars, for each of six different state programs in Kansas from 2007 to 2010.

Solution Video

Accompanying lectures for questions 29 - 36

Question 35: Annual Budgets for Different Programs in Kansas, 2007 to 2010

Program	*Year*			
Agriculture/natural resources	373,904	358,708	485,807	488,106
Education	2,164,607	2,413,984	2,274,514	3,008,036
General government	14,347,325	12,554,845	10,392,107	14,716,155
Highways and transportation	1,468,482	1,665,636	1,539,480	1,773,893
Human resources	4,051,050	4,099,067	4,618,444	5,921,379
Public safety	263,463	398,326	355,935	464,233

The table above lists the annual budget, in thousands of dollars, for each of six different state programs in Kansas from 2007 to 2010 .

Of the following, which program's ratio of its 2007 budget to its 2010 budget is closest to the human resources program's ratio of its 2007 budget to its 2010 budget?

A) Agriculture/natural resources

B) Education

C) Highways and transportation

D) Public safety

Solution Video

Question 36: A square field measures 10 meters by 10 meters. Ten students each mark off a randomly selected region of the field; each region is square and has side lengths of 1 meter, and no two regions overlap. The students count the earthworms contained in the soil to a depth of 5 centimeters beneath the ground's surface in each region. The results are shown in the table below.

Region	Number of earthworms	*Region*	Number of earthworms
A	107	F	141
B	147	G	150
C	146	H	154
D	135	I	176
E	149	J	166

Which of the following is a reasonable approximation of the number of earthworms to a depth of 5 centimeters beneath the ground's surface in the entire field?

A) 150

B) 1,500

C) 15,000

D) 150,000

Solution Video

Accompanying lectures for questions 37 - 37

Question 37: For what value of n is $|n-1|+1$ equal to 0?

A) 0

B) 1

C) 2

D) There is no such value of n.

Solution Video

Accompanying lectures for questions 38 - 39

Question 38: $a = 1,052 + 1.08t$

The speed of a sound wave in air depends on the air temperature. The formula above shows the relationship between a , the speed of a sound wave, in feet per second, and t , the air temperature, in degrees Fahrenheit $(^\circ\mathrm{F})$.

Which of the following expresses the air temperature in terms of the speed of a sound wave?

(A) $t = \dfrac{a - 1,052}{1.08}$

(B) $t = \dfrac{a + 1,052}{1.08}$

(C) $t = \dfrac{1,052 - a}{1.08}$

(D) $t = \dfrac{1.08}{a + 1,052}$

Solution Video

Question 39: $a = 1,052 + 1.08t$

The speed of a sound wave in air depends on the air temperature. The formula above shows the relationship between a , the speed of a sound wave, in feet per second, and t , the air temperature, in degrees Fahrenheit $(^\circ\mathrm{F})$.

At which of the following air temperatures will the speed of a sound wave be closest to 1,000 feet per second?

A) $-46^\circ\mathrm{F}$

B) $-48^\circ\mathrm{F}$

C) $-49^\circ\mathrm{F}$

D) $-50^\circ\mathrm{F}$

Solution Video

Accompanying lectures for questions 40 - 40

Question 40: Which of the following numbers is NOT a solution of the inequality

$3x - 5 \geq 4x - 3$?

A) -1

B) -2

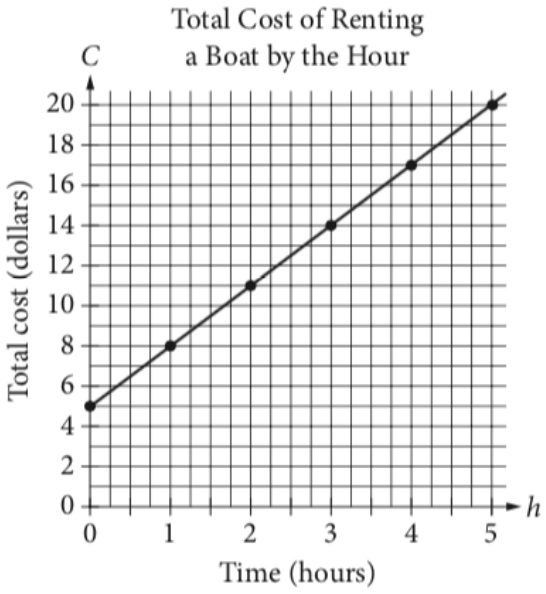
C) -3

D) -5

Solution Video

Accompanying lectures for questions 41 - 41

Question 41:



The graph above displays the total cost C , in dollars, of renting a boat for h hours.

Which of the following represents the relationship between h and C ?

A) $C = 5h$

B) $C = \frac{3}{4}h + 5$

C) $C = 3h + 5$

D) $h = 3C$

Solution Video

Accompanying lectures for questions 42 - 42

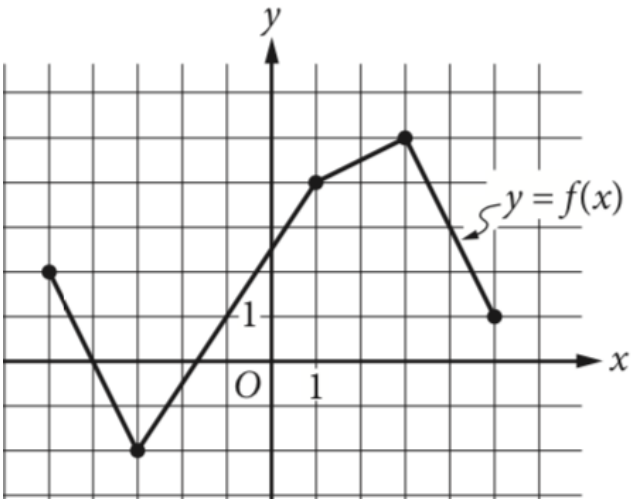
Question 42: The complete graph of the function f is shown in the xy-plane above. For what value of x is the value of $f(x)$ at its minimum?

A) -5

B) -3

C) -2

D) 3



Solution Video

Accompanying lectures for questions 43 - 43

Question 43:

$$\begin{aligned} y &< -x + a \\ y &> x + b \end{aligned}$$

In the xy -plane, if $(0, 0)$ is a solution to the system of inequalities above, which of the following relationships between a and b must be true?

A) $a > b$

B) $b > a$

C) $|a| > |b|$

D) $a = -b$

Solution Video

Accompanying lectures for questions 44 - 44

Question 44: A food truck sells salads for $\$6.50$ each and drinks for $\$2.00$ each. The food truck's revenue from selling a total of 209 salads and drinks in one day was $\$836.50$. How many salads were sold that day?

A) 77

B) 93

C) 99

D) 105

Solution Video

Accompanying lectures for questions 45 - 45

Question 45: Alma bought a laptop computer at a store that gave a 20 percent discount off its original price. The total amount she paid to the cashier was p dollars, including an 8 percent sales tax on the discounted price. Which of the following represents the original price of the computer in terms of p ?

A) $0.88p$

B) $\frac{p}{0.88}$

C) $(0.8)(1.08)p$

D) $\frac{p}{(0.8)(1.08)}$

Solution Video

Accompanying lectures for questions 46 - 46

Question 46: Which of the following is an equation of a circle in the xy -plane with center $(0, 4)$ and a radius with endpoint $\left(\frac{4}{3}, 5\right)$?

A) $x^2 + (y - 4)^2 = \frac{25}{9}$

B) $x^2 + (y + 4)^2 = \frac{25}{9}$

C) $x^2 + (y - 4)^2 = \frac{5}{3}$

D) $x^2 + (y + 4)^2 = \frac{3}{5}$

Solution Video

Accompanying lectures for questions 47 - 47

Question 47: $h = -4.9t^2 + 25t$

The equation above expresses the approximate height h , in meters, of a ball t seconds after it is launched vertically upward from the ground with an initial velocity of 25 meters per second. After approximately how many seconds will the ball hit the ground?

A) 3.5

B) 4.0

C) 4.5

D) 5.0

Solution Video

Accompanying lectures for questions 48 - 48

Question 48: Katarina is a botanist studying the production of pears by two types of pear trees. She noticed that Type A trees produced 20 percent more pears than Type B trees did. Based on Katarina's observation, if the Type A trees produced 144 pears, how many pears did the Type B trees produce?

A) 115

B) 120

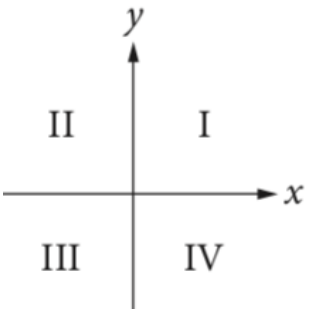
C) 124

D) 173

Solution Video

Accompanying lectures for questions 49 - 49

Question 49:



If the system of inequalities $y \geq 2x + 1$ and $y > \frac{1}{2}x - 1$ is graphed in the xy-plane above, which quadrant contains no solutions to the system?

A) Quadrant II

B) Quadrant III

C) Quadrant IV

D) There are solutions in all four quadrants.

Solution Video

Accompanying lectures for questions 50 - 50

Question 50: For a polynomial $p(x)$, the value of $p(3)$ is -2. Which of the following must be true about $p(x)$?

A) $x - 5$ is a factor of $p(x)$

B) $x - 2$ is a factor of $p(x)$.

C) $x + 2$ is a factor of $p(x)$

D) The remainder when $p(x)$ is divided by $x - 3$ is -2

Solution Video

Accompanying lectures for questions 51 - 51

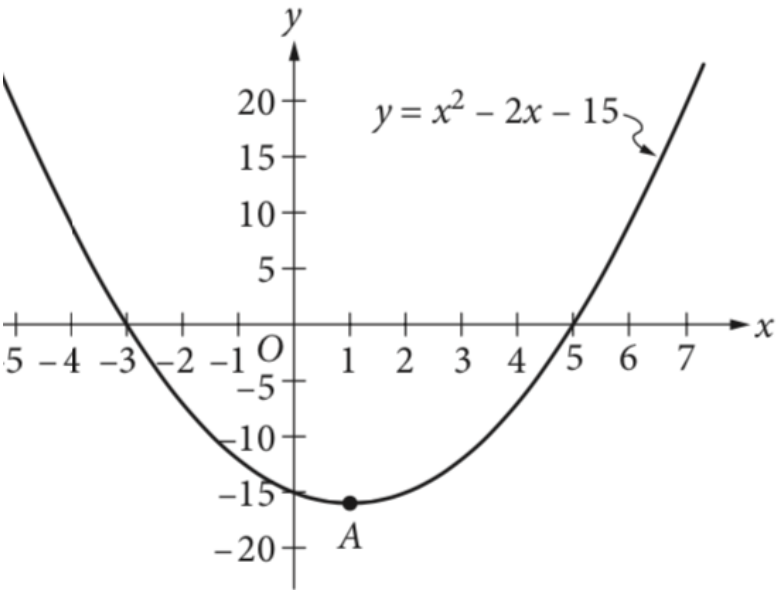
Question 51: Which of the following is an equivalent form of the equation of the graph shown in the xy-plane above, from which the coordinates of vertex A can be identified as constants in the equation?

A) $y = (x + 3)(x - 5)$

B) $y = (x - 3)(x + 5)$

C) $y = x(x - 2) - 15$

D) $y = (x - 1)^2 - 16$



Solution Video

Accompanying lectures for questions 52 - 52

Question 52: Wyatt can husk at least 12 dozen ears of corn per hour and at most 18 dozen ears of corn per hour. Based on this information, what is a possible amount of time, in hours, that it could take Wyatt to husk 72 dozen ears of corn?

Solution Video

Accompanying lectures for questions 53 - 53

Question 53: The posted weight limit for a covered wooden bridge in Pennsylvania is 6000 pounds. A delivery truck that is carrying x identical boxes each weighing 14 pounds will pass over the bridge.

If the combined weight of the empty delivery truck and its driver is 4500 pounds, what is the maximum possible value for x that will keep the combined weight of the truck, driver, and boxes below the bridge's posted weight limit?

Solution Video

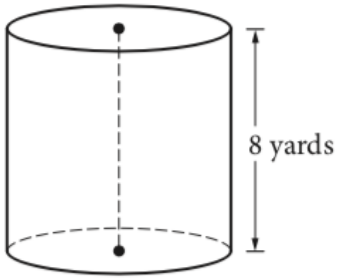
Accompanying lectures for questions 54 - 54

Question 54: A local television station sells time slots for programs in 30-minute intervals. If the station operates 24 hours per day, every day of the week, what is the total number of 30-minute time slots the station can sell for Tuesday and Wednesday?

Solution Video

Accompanying lectures for questions 55 - 55

Question 55:



A dairy farmer uses a storage silo that is in the shape of the right circular cylinder above. If the volume of the silo is 72π cubic yards, what is the diameter of the base of the cylinder, in yards?

Solution Video

Accompanying lectures for questions 56 - 56

Question 56: $h(x) = \dfrac{1}{(x-5)^2 + 4(x-5) + 4}$

For what value of x is the function h above undefined?

Solution Video

Accompanying lectures for questions 57 - 57

Question 57: Jessica opened a bank account that earns 2 percent interest compounded annually. Her initial deposit was $100, and she uses the expression $100(x)^t$ to find the value of the account after t years.

What is the value of x in the expression?

Solution Video

Accompanying lectures for questions 58 - 58

Question 58: Jessica opened a bank account that earns 2 percent interest compounded annually. Her initial deposit was $100, and she uses the expression $100(x)^t$ to find the value of the account after t years.

Jessica's friend Tyshaun found an account that earns 2.5 percent interest compounded annually.

Tyshaun made an initial deposit of $100 into this account at the same time Jessica made a deposit of $100 into her account.

After 10 years, how much more money will Tyshaun's initial deposit have earned than Jessica's initial deposit? (Round your answer to the nearest cent and ignore the dollar sign when gridding your response.)

Solution Video

Practice Test #2 - No Calculator Section

Accompanying lectures for questions 59 - 59

Question 59: If $5x + 6 = 10$, what is the value of $10x + 3$?

A) 4

B) 9

C) 11

D) 20

Solution Video

Accompanying lectures for questions 60 - 60

Question 60:

$$\begin{aligned} x + y &= 0 \\ 3x - 2y &= 10 \end{aligned}$$

Which of the following ordered pairs (x, y) satisfies the system of equations above?

$(3, -2)$

$(2, -2)$

$(-2, 2)$

$(-2, -2)$

Solution Video

Accompanying lectures for questions 61 - 61

Question 61: A landscaping company estimates the price of a job, in dollars, using the expression $60 + 12nh$, where n is the number of landscapers who will be working and h is the total number of hours the job will take using n landscapers.

Which of the following is the best interpretation of the number 12 in the expression?

A) The company charges $12 per hour for each landscaper.

B) A minimum of 12 landscapers will work on each job.

C) The price of every job increases by $12 every hour.

D) Each landscaper works 12 hours a day.

Solution Video

Accompanying lectures for questions 62 - 62

Question 62: $9a^4 + 12a^2b^2 + 4b^4$

Which of the following is equivalent to the expression shown above?

$(3a^2 + 2b^2)^2$

$(3a + 2b)^4$

$(9a^2 + 4b^2)^2$

$(9a + 4b)^4$

Solution Video

Accompanying lectures for questions 63 - 63

Question 63: $\sqrt{2k^2+17}-x=0$

If $k>0$ and $x=7$ in the equation above, what is the value of k ?

A) 2

B) 3

C) 4

D) 5

Solution Video

Accompanying lectures for questions 64 - 64

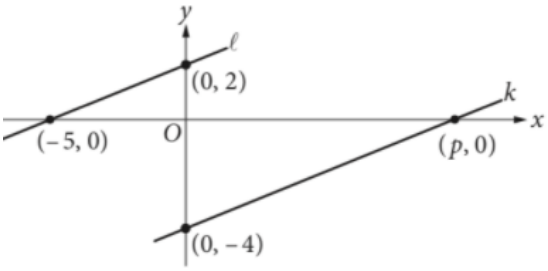
Question 64: In the xy-plane above, line ℓ is parallel to line k. What is the value of p?

A) 4

B) 5

C) 8

D) 10



Solution Video

Accompanying lectures for questions 65 - 65

Question 65: If $\frac{x^{a^2}}{x^{b^2}} = x^{16}, x > 1$, and $a + b = 2$, what is the value of $a - b$?

A) 8

B) 14

C) 16

D) 18

Solution Video

Accompanying lectures for questions 66 - 66

Question 66: $nA = 360^\circ$

The measure A , in degrees, of an exterior angle of a regular polygon is related to the number of sides, n , of the polygon by the formula above. If the measure of an exterior angle of a regular polygon is greater than 50° , what is the greatest number of sides it can have?

A) 5

B) 6

C) 7

D) 8

Solution Video

Accompanying lectures for questions 67 - 67

Question 67: The graph of a line in the xy -plane has slope 2 and contains the point $(1, 8)$. The graph of a second line passes through the points $(1, 2)$ and $(2, 1)$. If the two lines intersect at the point (a, b) , what is the value of $a + b$?

A) 4

B) 3

C) -1

D) -4

Solution Video

Accompanying lectures for questions 68 - 68

Question 68: Which of the following complex numbers is

equivalent to $\frac{3-5i}{8+2i}$? (Note: $i = \sqrt{-1}$)

$\frac{3}{8} - \frac{5i}{2}$

$\frac{3}{8} + \frac{5i}{2}$

$\frac{7}{34} - \frac{23i}{34}$

$\frac{7}{34} + \frac{23i}{34}$

Solution Video

Accompanying lectures for questions 69 - 69

Question 69: Which of the following equations has a graph in the xy -plane for which y is always greater than or equal to -1?

$y = |x| - 2$

$y = x^2 - 2$

$y = (x - 2)^2$

$y = x^3 - 2$

Solution Video

Accompanying lectures for questions 70 - 70

Question 70: $R = \dfrac{F}{N + F}$

A website uses the formula above to calculate a seller's rating, R , based on the number of favorable reviews, F , and unfavorable reviews, N . Which of the following expresses the number of favorable reviews in terms of the other variables?

$F = \dfrac{RN}{R - 1}$

$F = \dfrac{RN}{1 - R}$

$F = \dfrac{N}{1 - R}$

$F = \dfrac{N}{R - 1}$

Solution Video

Accompanying lectures for questions 71 - 71

Question 71: What is the sum of all values of m that satisfy

$2m^2 - 16m + 8 = 0$

A) -8

B) $-4\sqrt{3}$

C). $4\sqrt{3}$

D) 8

Solution Video

Accompanying lectures for questions 72 - 72

Question 72: A radioactive substance decays at an annual rate of 13 percent. If the initial amount of the substance is 325 grams, which of the following functions f models the remaining amount of the substance, in grams, t years later?

A) $f(t) = 325(0.87)^t$

B) $f(t) = 325(0.13)^t$

C) $f(t) = 0.87(325)^t$

D) $f(t) = 0.13(325)^t$

Solution Video

Accompanying lectures for questions 73 - 73

Question 73: The expression $\frac{5x-2}{x+3}$ is equivalent to which of the following?

$\frac{5-2}{3}$

$5-\frac{2}{3}$

$5-\frac{2}{x+3}$

$5-\frac{17}{x+3}$

Solution Video

Accompanying lectures for questions 74 - 74

Question 74: The sales manager of a company awarded a total of $3000 in bonuses to the most productive salespeople.

The bonuses were awarded in amounts of $250 or $750.

If at least one $250 bonus and at least one $750 bonus were awarded, what is one possible number of $250 bonuses awarded?

Solution Video

Accompanying lectures for questions 75 - 75

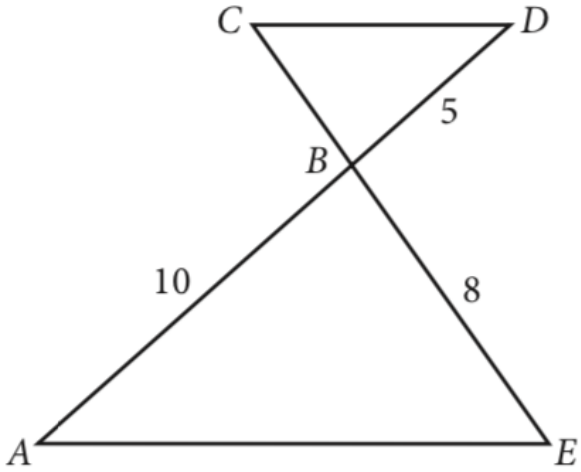
Question 75: $2x(3x+5)+3(3x+5)=ax^2+bx+c$

In the equation above, a, b , and c are constants. If the equation is true for all values of x , what is the value of b ?

Solution Video

Accompanying lectures for questions 76 - 76

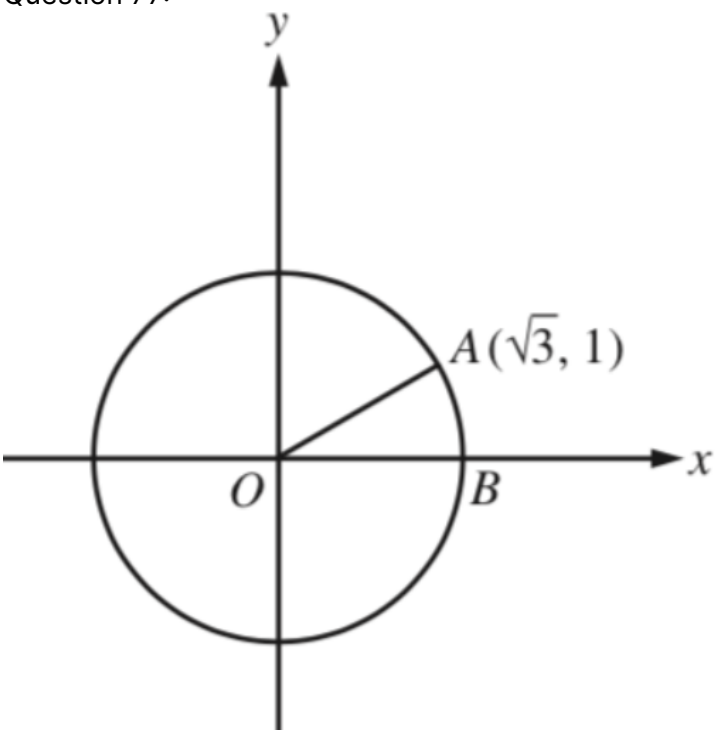
Question 76: In the figure above, $\overline{AE} \| \overline{CD}$ and segment AD intersects segment CE at B. What is the length of segment CE ?



Solution Video

Accompanying lectures for questions 77 - 77

Question 77:



In the xy -plane above, O is the center of the circle, and the measure of $\angle AOB$ is $\frac{\pi}{a}$ radians. What is the value of a ?

Solution Video

Accompanying lectures for questions 78 - 78

Question 78:

$$\begin{aligned} ax + by &= 12 \\ 2x + 8y &= 60 \end{aligned}$$

In the system of equations above, a and b are constants. If the system has infinitely many solutions, what is the value of $\frac{a}{b}$?

Solution Video

Practice Test #2 - Calculator Section

Accompanying lectures for questions 79 - 79

Question 79: A musician has a new song available for downloading or streaming. The musician earns $0.09 each time the song is downloaded and $0.002 each time the song is streamed. Which of the following expressions represents the amount, in dollars, that the musician earns if the song is downloaded d times and streamed s times?

A) $0.002d + 0.09s$

B) $0.002d - 0.09s$

C) $0.09d + 0.002s$

D) $0.09d - 0.002s$

Solution Video

Accompanying lectures for questions 80 - 80

Question 80: A quality control manager at a factory selects 7 lightbulbs at random for inspection out of every 400 lightbulbs produced. At this rate, how many lightbulbs will be inspected if the factory produces 20,000 lightbulbs?

A) 300

B) 350

C) 400

D) 450

Solution Video

Accompanying lectures for questions 81 - 82

Question 81: $\ell = 24 + 3.5m$

One end of a spring is attached to a ceiling. When an object of mass m kilograms is attached to the other end of the spring, the spring stretches to a length of ℓ centimeters as shown in the equation above. What is m when ℓ is 73 ?

A) 14

B) 27.7

C) 73

D) 279.5

Solution Video

Question 82: $a = 18t + 15$

Jane made an initial deposit to a savings account. Each week thereafter she deposited a fixed amount to the account.

The equation above models the amount a, in dollars, that Jane has deposited after t weekly deposits.

According to the model, how many dollars was Jane's initial deposit? (Disregard the $ sign when gridding your answer.)

Solution Video

Accompanying lectures for questions 83 - 84

Question 83: The amount of money a performer earns is directly proportional to the number of people attending the performance. The performer earns $120 at a performance where 8 people attend.

The performer uses 43% of the money earned to pay the costs involved in putting on each performance. The rest of the money earned is the performer's profit. What is the profit the performer makes at a performance where 8 people attend?

A) $51.60

B) $57.00

C) $68.40

D) $77.00

Solution Video

Question 84: The atomic weight of an unknown element, in atomic mass units (amu), is approximately 20% less than that of calcium. The atomic weight of calcium is 40 amu. Which of the following best approximates the atomic weight, in amu, of the unknown element?

A) 8

B) 20

C) 32

D) 48

Solution Video

Accompanying lectures for questions 85 - 85

Question 85: In a video game, each player starts the game with k points and loses 2 points each time a task is not completed. If a player who gains no additional points and fails to complete 100 tasks has a score of 200 points, what is the value of k ?

A) 0

B) 150

C) 250

D) 400

Solution Video

Accompanying lectures for questions 86 - 86

Question 86: $y = x^2 - 6x + 8$

The equation above represents a parabola in the xy -plane. Which of the following equivalent forms of the equation displays the x -intercepts of the parabola as constants or coefficients?

A) $y - 8 = x^2 - 6x$

B) $y + 1 = (x - 3)^2$

C) $y = x(x - 6) + 8$

D) $y = (x - 2)(x - 4)$

Solution Video

Accompanying lectures for questions 87 - 87

Question 87: A worker uses a forklift to move boxes that weigh either 40 pounds or 65 pounds each. Let x be the number of 40 -pound boxes and y be the number of 65 -pound boxes. The forklift can carry up to either 45 boxes or a weight of 2,400 pounds. Which of the following systems of inequalities represents this relationship?

$\begin{cases} 40x + 65y \leq 2,400 \\ x + y \leq 45 \end{cases}$

$\begin{cases} \frac{x}{40} + \frac{y}{65} \leq 2,400 \\ x + y \leq 45 \end{cases}$

$\begin{cases} 40x + 65y \leq 45 \\ x + y \leq 2,400 \end{cases}$

$\begin{cases} x + y \leq 2,400 \\ 40x + 65y \leq 2,400 \end{cases}$

Solution Video

Accompanying lectures for questions 88 - 88

Question 88: A function f satisfies $f(2) = 3$ and $f(3) = 5$. A function g satisfies $g(3) = 2$ and $g(5) = 6$. What is the value of $f(g(3))$?

A) 2

B) 3

C) 5

D) 6

Solution Video

Accompanying lectures for questions 89 - 92

Question 89:

Number of hours Tony plans to read the novel per day	3
Number of parts in the novel	8
Number of chapters in the novel	239
Number of words Tony reads per minute	250
Number of pages in the novel	1,078
Number of words in the novel	349,168

Tony is planning to read a novel. The table above shows information about the novel, Tony's reading speed, and the amount of time he plans to spend reading the novel each day. If Tony reads at the rates given in the table, which of the following is closest to the number of days it would take Tony to read the entire novel?

A) 6

B) 8

C) 23

D) 324

Solution Video

Question 90: Results on the Bar Exam of Law School Graduates

	Passed bar exam	Did not pass bar exam
Took review course	18	82
Did not take review course	7	93

The table above summarizes the results of 200 law school graduates who took the bar exam. If one of the surveyed graduates who passed the bar exam is chosen at random for an interview, what is the probability that the person chosen did not take the review course?

A) $\frac{18}{25}$

B) $\frac{7}{25}$

C) $\frac{25}{200}$

D) $\frac{7}{200}$

Solution Video

Question 91: A sociologist chose 300 students at random from each of two schools and asked each student how many siblings he or she has. The results are shown in the table below.

Students' Sibling Survey

Number of siblings	Lincoln School	Washington School
0	120	140
1	80	110
2	60	30
3	30	10
4	10	10

There are a total of 2,400 students at Lincoln School and 3,300 students at Washington School.

What is the median number of siblings for all the students surveyed?

A) 0

B)1

C) 2

D) 3

Solution Video

Accompanying lectures for questions 89 - 92

Question 92: A sociologist chose 300 students at random from each of two schools and asked each student how many siblings he or she has. The results are shown in the table below.

Students' Sibling Survey

Number of siblings	Lincoln School	Washington School
0	120	140
1	80	110
2	60	30
3	30	10
4	10	10

There are a total of 2,400 students at Lincoln School and 3,300 students at Washington School.

Based on the survey data, which of the following most accurately compares the expected total number of students with 4 siblings at the two schools?

A) The total number of students with 4 siblings is expected to be equal at the two schools.

B) The total number of students with 4 siblings at Lincoln School is expected to be 30 more than at Washington School.

C) The total number of students with 4 siblings at Washington School is expected to be 30 more than at Lincoln School.

D) The total number of students with 4 siblings at Washington School is expected to be 900 more than at Lincoln School.

Solution Video

Accompanying lectures for questions 93 - 94

Question 93: On January 1,2000, there were 175,000 tons of trash in a landfill that had a capacity of 325,000 tons. Each year since then, the amount of trash in the landfill increased by 7,500 tons. If y represents the time, in years, after January 1,2000, which of the following inequalities describes the set of years where the landfill is at or above capacity?

A) $325,000 - 7,500 \leq y$

B) $325,000 \leq 7,500y$

C) $150,000 \geq 7,500y$

D) $175,000 + 7,500y \geq 325,000$

Solution Video

Question 94: A project manager estimates that a project will take x hours to complete, where x > 100. The goal is for the estimate to be within 10 hours of the time it will actually take to complete the project. If the manager meets the goal and it takes y hours to complete the project, which of the following inequalities represents the relationship between the estimated time and the actual completion time?

A) $x + y < 10$

B) $y > x + 10$

C) $y < x - 10$

D) $-10 < y - x < 10$

Solution Video

Accompanying lectures for questions 95 - 95

Question 95: A researcher conducted a survey to determine whether people in a certain large town prefer watching sports on television to attending the sporting event.

The researcher asked 117 people who visited a local restaurant on a Saturday, and 7 people refused to respond. Which of the following factors makes it least likely that a reliable conclusion can be drawn about the sports-watching preferences of all people in the town?

A) Sample size

B) Population size

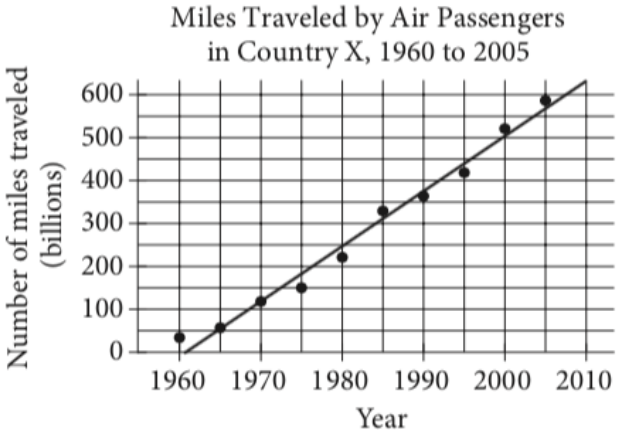
C) The number of people who refused to respond

D) Where the survey was given

Solution Video

Accompanying lectures for questions 96 - 96

Question 96:



According to the line of best fit in the scatterplot above, which of the following best approximates the year in which the number of miles traveled by air passengers in Country X was estimated to be 550 billion?

A) 1997

B) 2000

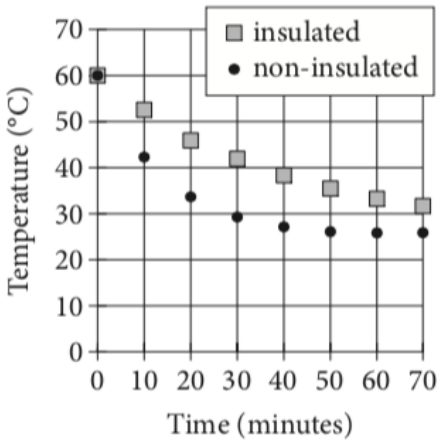
C) 2003

D) 2008

Solution Video

Accompanying lectures for questions 97 - 97

Question 97:



Two samples of water of equal mass are heated to 60 degrees Celsius (°C). One sample is poured into an insulated container, and the other sample is poured into a non-insulated container. The samples are then left for 70 minutes to cool in a room having a temperature of 25°C. The graph above shows the temperature of each sample at 10-minute intervals. Which of the following statements correctly compares the average rates at which the temperatures of the two samples change?

A) In every 10-minute interval, the magnitude of the rate of change of temperature of the insulated sample is greater than that of the non-insulated sample.

B) In every 10-minute interval, the magnitude of the rate of change of temperature of the non-insulated sample is greater than that of the insulated sample.

C) In the intervals from 0 to 10 minutes and from 10 to 20 minutes, the rates of change of temperature of the insulated sample are of greater magnitude, whereas in the intervals from 40 to 50 minutes and from 50 to 60 minutes, the rates of change of temperature of the non-insulated sample are of greater magnitude.

D) In the intervals from 0 to 10 minutes and from 10 to 20 minutes, the rates of change of temperature of the non-insulated sample are of greater magnitude, whereas in the intervals from 40 to 50 minutes and from 50 to 60 minutes, the rates of change of temperature of the insulated sample are of greater magnitude.

Solution Video

Accompanying lectures for questions 98 - 98

Question 98: A survey was taken of the value of homes in a county, and it was found that the mean home value was $165,000 and the median home value was $125,000. Which of the following situations could explain the difference between the mean and median home values in the county?

A) The homes have values that are close to each other.

B) There are a few homes that are valued much less than the rest.

C) There are a few homes that are valued much more than the rest.

D) Many of the homes have values between $125,000 and $165,000.

Solution Video

Accompanying lectures for questions 99 - 99

Question 99: $I = \dfrac{P}{4\pi r^2}$

At a large distance r from a radio antenna, the intensity of the radio signal I is related to the power of the signal P by the formula above.

Which of the following expresses the square of the distance from the radio antenna in terms of the intensity of the radio signal and the power of the signal?

A) $r^2 = \dfrac{IP}{4\pi}$

B) $r^2 = \dfrac{P}{4\pi I}$

C) $r^2 = \dfrac{4\pi I}{P}$

D) $r^2 = \dfrac{I}{4\pi P}$

Solution Video

Accompanying lectures for questions 100 - 100

Question 100: $I = \frac{P}{4\pi r^2}$

At a large distance r from a radio antenna, the intensity of the radio signal I is related to the power of the signal P by the formula above.

For the same signal emitted by a radio antenna, Observer A measures its intensity to be 16 times the intensity measured by Observer B . The distance of Observer A from the radio antenna is what fraction of the distance of Observer B from the radio antenna?

A) $\frac{1}{4}$

B) $\frac{1}{16}$

C) $\frac{1}{64}$

D) $\frac{1}{256}$

Solution Video

Accompanying lectures for questions 101 - 101

Question 101: $x^2 + y^2 + 4x - 2y = -1$

The equation of a circle in the xy -plane is shown above. What is the radius of the circle?

A) 2

B) 3

C) 4

D) 9

Solution Video

Accompanying lectures for questions 102 - 102

Question 102: The graph of the linear function f has intercepts at $(a, 0)$ and $(0, b)$ in the xy - plane. If $a + b = 0$ and $a \neq b$, which of the following is true about the slope of the graph of f ?

A) It is positive.

B) It is negative.

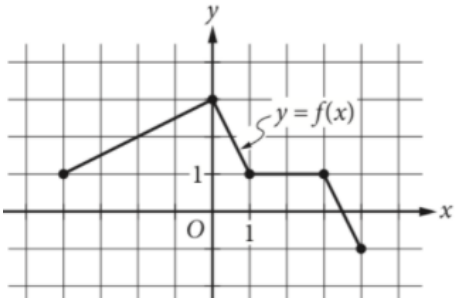
C) It equals zero.

D) It is undefined.

Solution Video

Accompanying lectures for questions 103 - 103

Question 103:



The complete graph of the function f is shown in the xy-plane above. Which of the following are equal to 1 ?

I. $f(-4)$

II. $f\left(\frac{3}{2}\right)$

III. $f(3)$

A) III only

B) I and III only

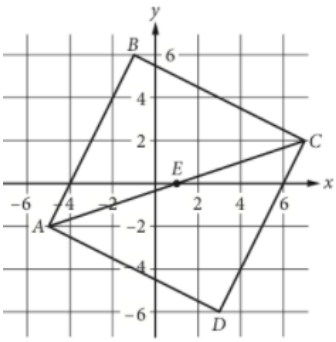
C) II and III only

D) I, II, and III

Solution Video

Accompanying lectures for questions 104 - 104

Question 104: In the xy-plane above, $ABCD$ is a square and point E is the center of the square. The coordinates of points C and E are $(7, 2)$ and $(1, 0)$ respectively. Which of the following is an equation of the line that passes through points B and D?



A) $y = -3x - 1$

B) $y = -3(x - 1)$

C) $y = -\frac{1}{3}x + 4$

D) $y = -\frac{1}{3}x - 1$

Solution Video

Accompanying lectures for questions 105 - 105

Question 105: A coastal geologist estimates that a certain country's beaches are eroding at a rate of 1.5 feet per year. According to the geologist's estimate, how long will it take, in years, for the country's beaches to erode by 21 feet?

Solution Video

Accompanying lectures for questions 106 - 106

Question 106: If h hours and 30 minutes is equal to 450 minutes, what is the value of h ?

Solution Video

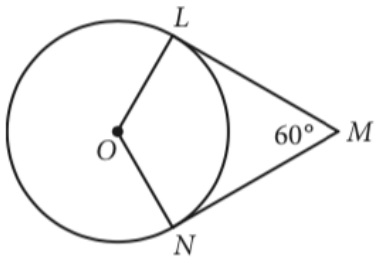
Accompanying lectures for questions 107 - 107

Question 107: In one semester, Doug and Laura spent a combined 250 hours in the tutoring lab. If Doug spent 40 more hours in the lab than Laura did, how many hours did Laura spend in the lab?

Solution Video

Accompanying lectures for questions 108 - 108

Question 108:



In the figure above, point O is the center of the circle, line segments LM and MN are tangent to the circle at points L and N, respectively, and the segments intersect at point M as shown. If the circumference of the circle is 96, what is the length of minor arc LN ?

Solution Video

Accompanying lectures for questions 109 - 110

Question 109: A botanist is cultivating a rare species of plant in a controlled environment and currently has 3000 of these plants. The population of this species that the botanist expects to grow next year, $N_{nextyear}$, can be estimated from the number of plants this year, $N_{thisyear}$, by the equation below.

$$N_{\text{next year}} = N_{\text{this year}} + 0.2\,(N_{\text{this year}})\left(1 - \frac{N_{\text{this year}}}{K}\right)$$

The constant K in this formula is the number of plants the environment is able to support.

According to the formula, what will be the number of plants two years from now if K = 4000 ? (Round your answer to the nearest whole number.)

Solution Video

Question 110: A botanist is cultivating a rare species of plant in a controlled environment and currently has 3000 of these plants.

The population of this species that the botanist expects to grow next year, $N_{nextyear}$, can be estimated from the number of plants this year, $N_{thisyear}$, by the equation below.

$$N_{\text{next year}} = N_{\text{this year}} + 0.2\,(N_{\text{this year}})\left(1 - \frac{N_{\text{this year}}}{K}\right)$$

The constant K in this formula is the number of plants the environment is able to support.

The botanist would like to increase the number of plants that the environment can support so that the population of the species will increase more rapidly.

If the botanist's goal is that the number of plants will increase from 3000 this year to 3360 next year, how many plants must the modified environment support?

Solution Video

Practice Test #3 - No Calculator Section

Accompanying lectures for questions 111 - 111

Question 111: A painter will paint n walls with the same size and shape in a building using a specific brand of paint. The painter's fee can be calculated by the expression $nKlh$, where n is the number of walls, K is a constant with units of dollars per square foot, l is the length of each wall in feet, and h is the height of each wall in feet. If the customer asks the painter to use a more expensive brand of paint, which of the factors in the expression would change?

A) h

B) l

C) K

D) n

Solution Video

Accompanying lectures for questions 112 - 113

Question 112: If 3r = 18, what is the value of 6r + 3 ?

A) 6

B) 27

C) 36

D) 39

Solution Video

Question 113: If $\frac{5}{x} = \frac{15}{x+20}$, what is the value of $\frac{x}{5}$?

A) 10

B) 5

C) 2

D) $\frac{1}{2}$

Solution Video

Accompanying lectures for questions 114 - 114

Question 114: Which of the following is equal to $a^{\frac{2}{3}}$, for all values of a?

A) $\sqrt{a^{\frac{1}{3}}}$

B) $\sqrt{a^3}$

C) $\sqrt[3]{a^{\frac{1}{2}}}$

D) $\sqrt[3]{a^2}$

Solution Video

Accompanying lectures for questions 115 - 115

Question 115: The number of states that joined the United States between 1776 and 1849 is twice the number of states that joined between 1850 and 1900. If 30 states joined the United States between 1776 and 1849 and x states joined between 1850 and 1900, which of the following equations is true?

A) $30x = 2$

B) $2x = 30$

C) $\frac{x}{2} = 30$

D) $x + 30 = 2$

Solution Video

Accompanying lectures for questions 116 - 116

Question 116:

$$\begin{aligned} 2x - 3y &= -14 \\ 3x - 2y &= -6 \end{aligned}$$

If (x, y) is a solution to the system of equations above, what is the value of $x - y$?

A) -20

B) -8

C) -4

D) 8

Solution Video

Accompanying lectures for questions 117 - 117

Question 117:

x	$f(x)$
0	3
2	1
4	0
5	-2

The function f is defined by a polynomial. Some values of x and $f(x)$ are shown in the table above. Which of the following must be a factor of $f(x)$?

A) $x-2$

B) $x-3$

C) $x-4$

D) $x-5$

Solution Video

Accompanying lectures for questions 118 - 118

Question 118: The line $y = kx + 4$, where k is a constant, is graphed in the xy -plane. If the line contains the point (c, d), where $c \neq 0$ and $d \neq 0$, what is the slope of the line in terms of c and d ?

A) $\frac{d-4}{c}$

B) $\frac{c-4}{d}$

C) $\frac{4-d}{c}$

D) $\frac{4-c}{d}$

Solution Video

Accompanying lectures for questions 119 - 119

Question 119:

$$\begin{aligned} kx - 3y &= 4 \\ 4x - 5y &= 7 \end{aligned}$$

In the system of equations above, k is a constant and x and y are variables. For what value of k will the system of equations have no solution?

A) $\frac{12}{5}$

B) $\frac{16}{7}$

C) $-\frac{16}{7}$

D) $-\frac{12}{5}$

Solution Video

Accompanying lectures for questions 120 - 120

Question 120: In the xy-plane, the parabola with equation $y = (x - 11)^2$ intersects the line with equation $y = 25$ at two points, A and B. What is the length of $\overline{AB}$?

A) 10

B) 12

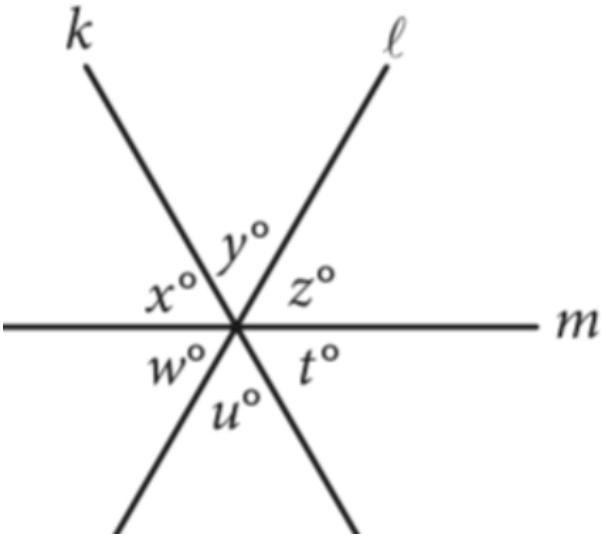
C) 14

D) 16

Solution Video

Accompanying lectures for questions 121 - 121

Question 121:



Note: Figure not drawn to scale.

In the figure above, lines k, ℓ, and m intersect at a point. If $x + y = u + w$, which of the following must be true?

I. $x = z$

II. $y = w$

III. $z = t$

A) I and II only

B) I and III only

C) II and III only

D) I, II, and III

Solution Video

Accompanying lectures for questions 122 - 122

Question 122: $y = a(x - 2)(x + 4)$

In the quadratic equation above, a is a nonzero constant. The graph of the equation in the xy -plane is a parabola with vertex (c, d). Which of the following is equal to d ?

A) $-9a$

B) $-8a$

C) $-5a$

D) $-2a$

Solution Video

Accompanying lectures for questions 123 - 123

Question 123: The equation $\frac{24x^2 + 25x - 47}{ax - 2} = -8x - 3 - \frac{53}{ax - 2}$ is true for all values of $x \neq \frac{2}{a}$, where a is a constant.

What is the value of a ?

A) -16

B) -3

C) 3

D) 16

Solution Video

Accompanying lectures for questions 124 - 124

Question 124: What are the solutions to $3x^2 + 12x + 6 = 0$?

A) $x = -2 \pm \sqrt{2}$

B) $x = -2 \pm \frac{\sqrt{30}}{3}$

C) $x = -6 \pm \sqrt{2}$

D) $x = -6 \pm 6\sqrt{2}$

Solution Video

Accompanying lectures for questions 125 - 125

Question 125: $C = \frac{5}{9}(F - 32)$

The equation above shows how a temperature F, measured in degrees Fahrenheit, relates to a temperature C, measured in degrees Celsius. Based on the equation, which of the following must be true?

I. A temperature increase of 1 degree Fahrenheit is equivalent to a temperature increase of $\frac{5}{9}$ degree Celsius.

II. A temperature increase of 1 degree Celsius is equivalent to a temperature increase of

1. 8 degrees Fahrenheit.

III. A temperature increase of $\frac{5}{9}$ degree Fahrenheit is equivalent to a temperature increase of 1 degree Celsius.

A) I only

B) II only

C) III only

D) I and II only

Solution Video

Accompanying lectures for questions 126 - 126

Question 126: $x^3(x^2 - 5) = -4x$

If $x > 0$, what is one possible solution to the equation above?

Solution Video

Accompanying lectures for questions 127 - 127

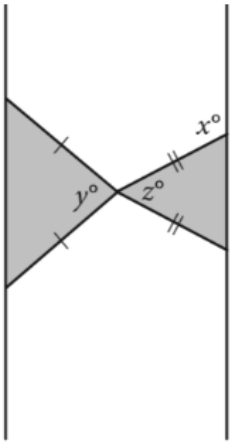
Question 127: If $\frac{7}{9}x - \frac{4}{9}x = \frac{1}{4} + \frac{5}{12}$,

what is the value of x?

Solution Video

Accompanying lectures for questions 128 - 128

Question 128: Two isosceles triangles are shown above. If $180 - z = 2y$ and $y = 75$, what is the value of x ?



Note: Figure not drawn to scale.

Solution Video

Accompanying lectures for questions 129 - 129

Question 129: At a lunch stand, each hamburger has 50 more calories than each order of fries. If 2 hamburgers and 3 orders of fries have a total of 1700 calories, how many calories does a hamburger have?

Solution Video

Accompanying lectures for questions 130 - 130

Question 130: In triangle ABC, the measure of ∠B is 90°, BC = 16, and AC = 20.

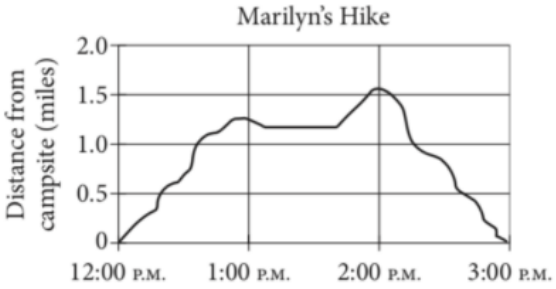
Triangle DEF is similar to triangle ABC, where vertices D, E, and F correspond to vertices A, B, and C, respectively, and each side of triangle DEF is $\frac{1}{3}$ the length of the corresponding side of triangle ABC. What is the value of $\sin F$?

Solution Video

Practice Test #3 - Calculator Section

Accompanying lectures for questions 131 - 131

Question 131:



The graph above shows Marilyn's distance from her campsite during a 3 -hour hike. She stopped for 30 minutes during her hike to have lunch. Based on the graph, which of the following is closest to the time she finished lunch and continued her hike?

A) 12:40 P.M.

B) 1:10 P.M.

C) 1:40 P.M.

D) 2 : 00 P.M.

Solution Video

Accompanying lectures for questions 132 - 133

Question 132: The table above shows the distribution of age and gender for 25 people who entered a contest. If the contest winner will be selected at random, what is the probability that the winner will be either a female under age 40 or a male age 40 or older?

A) $\frac{4}{25}$

B) $\frac{10}{25}$

C) $\frac{11}{25}$

D) $\frac{16}{25}$

Solution Video

Question 133: 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, 300 participants were selected at random. Half of the participants were randomly assigned to receive treatment X, and the other half did not 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 is likely to improve the eyesight of people who have poor eyesight.

B) Treatment X improves eyesight better than all other available treatments.

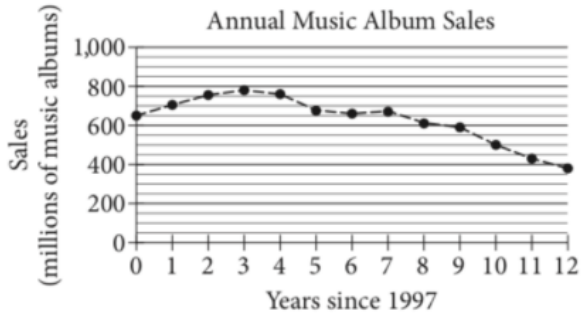
C) Treatment X will improve the eyesight of anyone who takes it.

D) Treatment X will cause a substantial improvement in eyesight

Solution Video

Accompanying lectures for questions 134 - 134

Question 134: The graph below shows the total number of music album sales, in millions, each year from 1997 through 2009 .



Based on the graph, which of the following best describes the general trend in music album sales from 1997 through 2009 ?

A) Sales generally increased each year since 1997.

B) Sales generally decreased each year since 1997.

C) Sales increased until 2000 and then generally decreased.

D) Sales generally remained steady from 1997 through 2009 .

Solution Video

Accompanying lectures for questions 135 - 136

Question 135:

n	1	2	3	4
$f(n)$	-2	1	4	7

The table above shows some values of the linear function f. Which of the following defines f?

A) $f(n) = n - 3$

B) $f(n) = 2n - 4$

C) $f(n) = 3n - 5$

D) $f(n) = 4n - 6$

Solution Video

Question 136: The average number of students per classroom at Central High School from 2000 to 2010 can be modeled by the equation $y = 0.56x + 27.2$, where x represents the number of years since 2000, and y represents the average number of students per classroom. Which of the following best describes the meaning of the number 0.56 in the equation?

A) The total number of students at the school in 2000

B) The average number of students per classroom in 2000

C) The estimated increase in the average number of students per classroom each year

D) The estimated difference between the average number of students per classroom in 2010 and in 2000

Solution Video

Accompanying lectures for questions 137 - 139

Question 137: At Lincoln High School, approximately 7 percent of enrolled juniors and 5 percent of enrolled seniors were inducted into the National Honor Society last year. If there were 562 juniors and 602 seniors enrolled at 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 were inducted into the National Honor Society?

A) 140

B) 69

C) 39

D) 30

Solution Video

Question 138: The sum of three numbers is 855. One of the numbers, x, is 50% more than the sum of the other two numbers. What is the value of x ?

A) 570

B) 513

C) 214

D) 155

Solution Video

Question 139: 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 12 percent, what is the value of p ?

A) 12

B) 15

C) 20

D) 22

Solution Video

Accompanying lectures for questions 140 - 140

Question 140: $3x^2 - 5x + 2$
$5x^2 - 2x - 6$

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

A) $8x^2 - 7x - 4$

B) $8x^2 + 7x - 4$

C) $8x^4 - 7x^2 - 4$

D) $8x^4 + 7x^2 - 4$

Solution Video

Accompanying lectures for questions 141 - 141

Question 141: If $\frac{3}{5}w = \frac{4}{3}$, what is the value of w ?

A) $\frac{9}{20}$

B) $\frac{4}{5}$

C) $\frac{5}{4}$

D) $\frac{20}{9}$

Solution Video

Accompanying lectures for questions 142 - 142

Question 142: Nate walks 25 meters in 13.7seconds. If he walks at this same rate, which of the following is closest to the distance he will walk in 4 minutes?

A) 150 meters

B) 450 meters

C) 700 meters

D) 1,400 meters

Solution Video

Accompanying lectures for questions 143 - 144

Question 143:

$Planet$	Acceleration due to gravity $\left(\frac{\text{m}}{\text{sec}^2}\right)$
$Mercury$	3.6
$Venus$	8.9
$Earth$	9.8
$Mars$	3.8
$Jupiter$	26.0
$Saturn$	11.1
$Uranus$	10.7
$Neptune$	14.1

The chart above shows approximations of the acceleration due to gravity in meters per second squared m/sec^2 for the eight planets in our solar system. The weight of an object on a given planet can be found by using the formula W = mg, where W is the weight of the object measured in newtons, m is the mass of the object measured in kilograms, and g is the acceleration due to gravity on the planet measured in m/sec^2.

What is the weight, in newtons, of an object on Mercury with a mass of 90 kilograms?

A) 25

B) 86

C) 101

D) 324

Solution Video

Question 144:

$Planet$	Acceleration due to gravity $\left(\frac{\text{m}}{\text{sec}^2}\right)$
$Mercury$	3.6
$Venus$	8.9
$Earth$	9.8
$Mars$	3.8
$Jupiter$	26.0
$Saturn$	11.1
$Uranus$	10.7
$Neptune$	14.1

The chart above shows approximations of the acceleration due to gravity in meters per second squared m/sec^2

for the eight planets in our solar system. The weight of an object on a given planet can be found by using the formula $W = mg$, where W is the weight of the object measured in newtons, m is the mass of the object measured in kilograms, and g is the acceleration due to gravity on the planet measured in m/sec^2

An object on Earth has a weight of 150 newtons. On which planet would the same object have an approximate weight of 170 newtons?

A) Venus

B) Saturn

C) Uranus

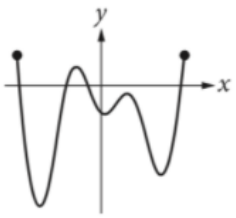
D) Neptune

Solution Video

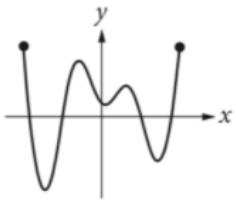
Accompanying lectures for questions 145 - 145

Question 145: If the function f has five distinct zeros, which of the following could represent the complete graph of f in the xy-plane?

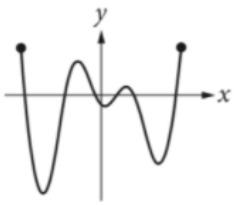
A)



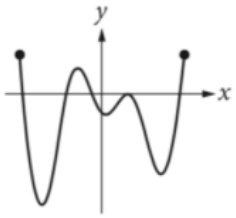
B)



C)



D)



Solution Video

Accompanying lectures for questions 146 - 146

Question 146: $h = -16t^2 + vt + k$

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

A) $v = h + k - 16t$

B) $v = \dfrac{h - k + 16}{t}$

C) $v = \dfrac{h + k}{t} - 16t$

D) $v = \dfrac{h - k}{t} + 16t$

Solution Video

Accompanying lectures for questions 147 - 147

Question 147: The cost of using a telephone in a hotel meeting room is $\$0.20$ per minute. Which of the following equations represents the total cost c, in dollars, for h hours of phone use?

A) $c = 0.20(60h)$

B) $c = 0.20h + 60$

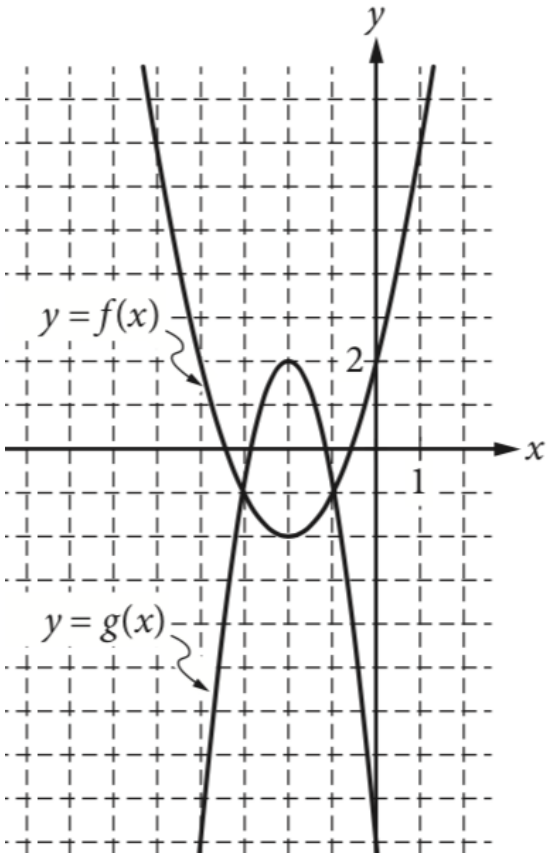
C) $c = \dfrac{60h}{0.20}$

D) $c = \dfrac{0.20h}{60}$

Solution Video

Accompanying lectures for questions 148 - 148

Question 148:



Graphs of the functions f and g are shown in the xy-plane above. For which of the following values of x does $f(x) + g(x) = 0$?

A) -3

B) -2

C) -1

D) 0

Solution Video

Accompanying lectures for questions 149 - 150

Question 149:

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

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 when 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 $10 ?

A) The quantity supplied will decrease by 5 units.

B) The quantity supplied will increase by 5 units.

C) The quantity supplied will increase by 10 units.

D) The quantity supplied will increase by 50 units.

Solution Video

Question 150:

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

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 when 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.

At what price will the quantity of the product supplied to the market equal the quantity of the product demanded by the market?

A) $90

B) $120

C) $133

D) $155

Solution Video

Accompanying lectures for questions 151 - 151

Question 151: Graphene, which is used in the 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 48 ounces of graphene cover?

A) 250

B) 350

C) 450

D) 1350

Solution Video

Accompanying lectures for questions 152 - 152

Question 152: Of the following four types of savings account plans, which option would yield exponential growth of the money in the account?

A) Each successive year, 2% of the initial savings is added to the value of the account.

B) Each successive year, 1.5% of the initial savings and $100 is added to the value of the account.

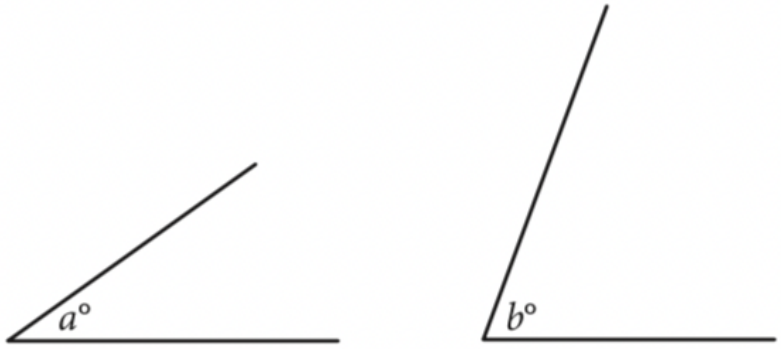
C) Each successive year, 1% of the current value is added to the value of the account.

D) Each successive year, $100 is added to the value of the account.

Solution Video

Accompanying lectures for questions 153 - 153

Question 153:



Note: Figures not drawn to scale.

Note: Figures not drawn to scale.

The angles shown above are acute and $\sin(a^\circ) = \cos(b^\circ)$. If $a = 4k - 22$ and $b = 6k - 13$, what is the value of k ?

A) 4.5

B) 5.5

C) 12.5

D) 21.5

Solution Video

Accompanying lectures for questions 154 - 154

Question 154: Mr. Kohl has a beaker containing n milliliters of solution to distribute to the students in his chemistry class. If he gives each student 3 milliliters of solution, he will have 5 milliliters left over. In order to give each student 4 milliliters of solution, he will need an additional 21 milliliters. How many students are in the class?

A) 16

B) 21

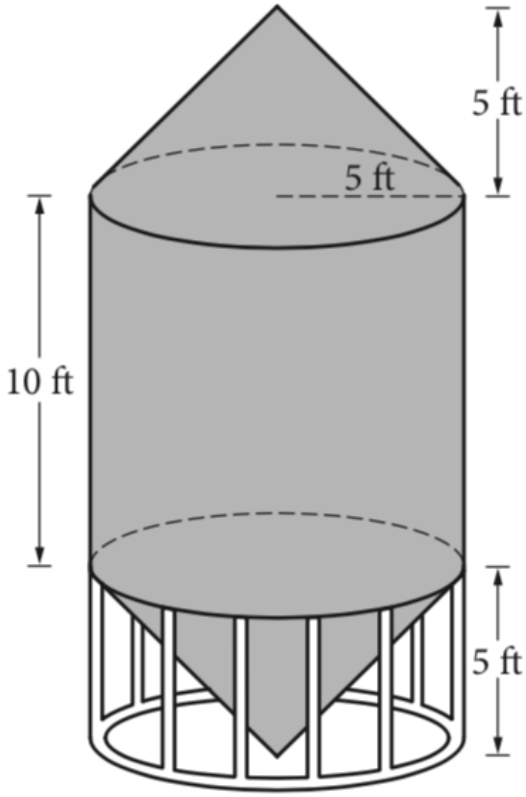
C) 23

D) 26

Solution Video

Accompanying lectures for questions 155 - 155

Question 155: 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) 785.4

C) 916.3

D) 1047.2

Solution Video

Accompanying lectures for questions 156 - 156

Question 156: In the xy-plane, the line determined by the points (2, k) and (k, 32) passes through the origin. Which of the following could be the value of k ?

A) 0

B) 4

C) 8

D) 16

Solution Video

Accompanying lectures for questions 157 - 157

Question 157:

	$Handedness$	
$Gender$	$Left$	$Right$
$Female$		
$Male$		
$Total$	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 18 left-handed students and 122 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) 0.357

C) 0.333

D) 0.250

Solution Video

Accompanying lectures for questions 158 - 158

Question 158:

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

In the equations above, b and c are constants.

If b is c minus $\frac{1}{2}$, 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 $\frac{1}{2}$.

Solution Video

Accompanying lectures for questions 159 - 159

Question 159: Tickets for a school talent show cost $2 for students and $3 for adults. If Chris spends at least $11 but no more than $14 on x student tickets and 1 adult ticket, what is one possible value of x ?

Solution Video

Accompanying lectures for questions 160 - 160

Question 160: Ages of the First 12 United States Presidents at the Beginning of Their Terms in Office

$President$	$Age(years)$	$President$	$Age(years)$
$Washington$	57	$Jackson$	62
$Adams$	62	$VanBuren$	55
$Jefferson$	58	$Harrison$	68
$Madison$	58	$Tyler$	51
$Monroe$	59	$Polk$	50
$Adams$	58	$Taylor$	65

The table above lists the ages of the first 12 United States presidents when they began their terms in office. According to the table, what was the mean age, in years, of these presidents at the beginning of their terms? (Round your answer to the nearest tenth.)

Solution Video

Accompanying lectures for questions 161 - 161

Question 161: $\left(-3x^2+5x-2\right)-2\left(x^2-2x-1\right)$

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

the value of b ?

Solution Video

Accompanying lectures for questions 162 - 163

Question 162: If shoppers enter a store at an average rate of r shoppers per minute and each stays in the store for an average time of T minutes, the average number of shoppers in the store, N, at any one time is given by the formula $N = rT$. This relationship is known as Little's law. The owner of the Good Deals Store estimates that during business hours, an average of 3 shoppers per minute enter the store and that each of them stays an average of 15 minutes. The store owner uses Little's law to estimate that there are 45 shoppers in the store at any time.

Little's law can be applied to any part of the store, such as a particular department or the checkout lines. The store owner determines that, during business hours, approximately 84 shoppers per hour make a purchase and each of these shoppers spends an average of 5 minutes in the checkout line. At any time during business hours, about how many shoppers, on average, are waiting in the checkout line to make a purchase at the Good Deals Store?

Solution Video

Question 163: If shoppers enter a store at an average rate of r shoppers per minute and each stays in the store for an average time of T minutes, the average number of shoppers in the store, N, at any one time is given by the formula $N = rT$. This relationship is known as Little's law. The owner of the Good Deals Store estimates that during business hours, an average of 3 shoppers per minute enter the store and that each of them stays an average of 15 minutes. The store owner uses Little's law to estimate that there are 45 shoppers in the store at any time.

The owner of the Good Deals Store opens a new store across town. For the new store, the owner estimates that, during business hours, an average of 90 shoppers per hour enter the store and each of them stays an average of 12 minutes. The average number of shoppers in the new store at any time is what percent less than the average number of shoppers in the original store at any time? (Note: Ignore the percent symbol when entering your answer. For example, if the answer is 42.1%, enter 42.1)

Solution Video