

MATHEMATICS TEST—NO CALCULATOR

25 MINUTES, 20 QUESTIONS

Turn to Section 3 of your answer sheet to answer the questions in this section.

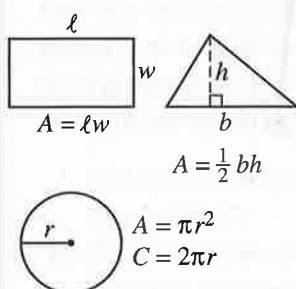
Directions: For questions 1–15, solve each problem and choose the best answer from the given options. Fill in the corresponding circle on your answer document. For questions 16–20, solve the problem and fill in the answer on the answer sheet grid.

Notes:

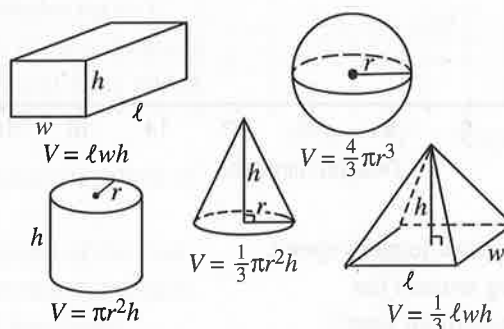
- Calculators are **NOT PERMITTED** in this section.
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- All figures are drawn to scale unless indicated otherwise.
- All figures are in a plane unless indicated otherwise.
- Unless indicated otherwise, the domain of a given function is the set of all real numbers x for which the function has real values.

REFERENCE INFORMATION

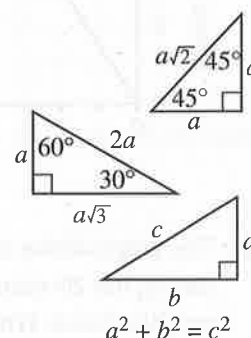
Area Facts



Volume Facts



Triangle Facts



The arc of a circle contains 360° .

The arc of a circle contains 2π radians.

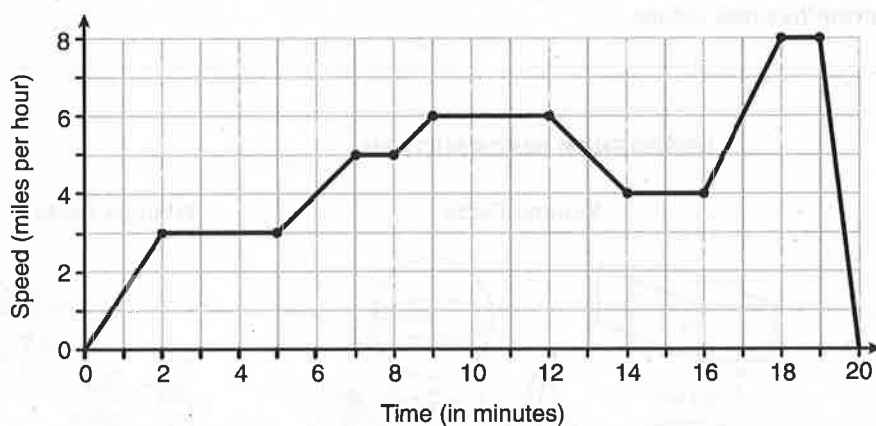
The sum of the measures of the angles in a triangle is 180° .

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$$\frac{5x - 3y}{3x + 5y} + \frac{2}{3} = 1$$

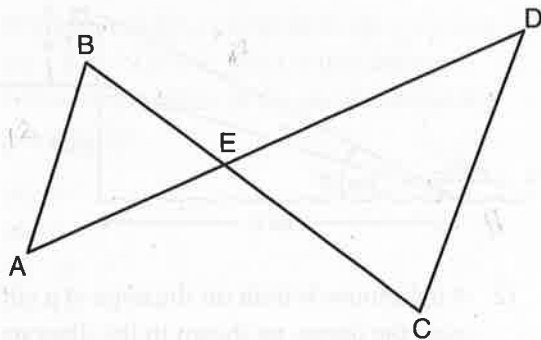
1. In the equation above, what is the value of $\frac{x}{y}$?

- (A) $\frac{1}{3}$
 (B) $\frac{2}{3}$
 (C) $\frac{5}{6}$
 (D) $\frac{7}{6}$



2. The graph above represents a jogger's speed during her 20-minute jog around her neighborhood. Which statement best describes what the jogger was doing during the 9–12 minute interval of her jog?

- (A) She was standing still.
 (B) She was increasing her speed.
 (C) She was decreasing her speed.
 (D) She was jogging at a constant rate.



Note: Figure is not drawn to scale.

3. In the figure above, $\overline{AB} \parallel \overline{CD}$, $AD = 42$, $AB = 12$, and $CD = 16$. What is the length of \overline{DE} ?

(A) 21
(B) 24
(C) 27
(D) 30

$$C = 60 + 0.25d$$

4. The equation above represents the monthly cost of a cell phone that includes up to 1 gigabyte of data after which there is a charge for d gigabytes of any additional data. Which of the following must be true?

- I. The cost of each additional megabyte of data is \$60.25.
- II. The y -intercept of the graph of the cost equation represents the charge for each additional megabyte of data used.
- III. If between 5 and 6 megabytes of data are used in a month, the monthly charge is \$61.25.

(A) I and II only
(B) I and III only
(C) II only
(D) III only

5. For what set of values of x is the expression $|3x + 4| < 0$ true?

(A) $-\frac{4}{3} < 0 < x$
(B) $x < -\frac{4}{3}$
(C) No real numbers
(D) All real numbers

6. The distance a free falling object has traveled can be modeled by the equation $d = \frac{1}{2}at^2$

where a is acceleration due to gravity and t is the amount of time the object has fallen. What is t in terms of a and d ?

(A) $t = \sqrt{\frac{da}{2}}$
(B) $t = \sqrt{\frac{2d}{a}}$
(C) $t = \left(\frac{da}{2}\right)^2$
(D) $t = \left(\frac{2d}{a}\right)^2$

7. If $x^2 - y^2 = 24$ and $x - y = 3$, what is the value of y ?

(A) $\frac{1}{2}$
(B) $\frac{3}{2}$
(C) $\frac{7}{4}$
(D) $\frac{5}{2}$

8. If $\frac{z}{2b} = 4$, $\frac{z}{2c} = 6$, and $2b + 3c = 12$, what is the value of z ?

(A) 16
(B) 20
(C) 24
(D) 48

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9. A pizza parlor has a fixed initial cost of \$180,000, and a variable cost of \$4 for each pizza sold. If the pizza parlor charges \$10 for each pizza, how many pizzas will it have to sell before it makes a profit?

(A) 24,000
(B) 30,000
(C) 38,000
(D) 42,000

$$(ax + 7)(bx - 1) = 12x^2 + kx + (b - 13)$$

10. If the equation above is true for all values of x where a , b , and k are non-zero constants, what is the value of k ?

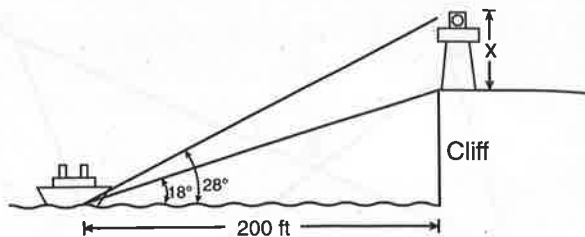
(A) 40
(B) 25
(C) 17
(D) 8

11. Function f is defined by the equation

$$f(x) = ax^2 + \frac{2}{a}x. \text{ If } f(3) - f(2) = 11, \text{ what is}$$

the *smallest* possible value of a ?

(A) $\frac{1}{6}$
(B) $\frac{1}{5}$
(C) $\frac{1}{2}$
(D) 2



12. A lighthouse is built on the edge of a cliff near the ocean, as shown in the diagram above. From a boat located 200 feet from the base of the cliff, the angle of elevation to the top of the cliff is 18° and the angle of elevation to the top of the lighthouse is 28° . Which of the following equations could be used to find the height of the lighthouse, x , in feet?

(A) $x = 200 \tan 10^\circ$
(B) $x = 200(\tan 28^\circ - \tan 18^\circ)$
(C) $x = \frac{200}{(\tan 28^\circ - \tan 18^\circ)}$
(D) $x = 200 \left(\frac{\tan 18^\circ}{\tan 28^\circ} \right)$

13. The local deli charges a fee for delivery. On Monday, they delivered two dozen bagels to an office at a total cost of \$8. On Tuesday, three dozen bagels were delivered at a total cost of \$11. Which system of equations could be used to find the cost of a dozen bagels, b , if the delivery fee is f ?

(A) $b + 2f = 8$
 $b + 3f = 11$
(B) $2b + f = 8$
 $b + 3f = 11$
(C) $b + 2f = 8$
 $3b + f = 11$
(D) $2b + f = 8$
 $3b + f = 11$

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14. The equation of a parabola in the xy -plane is $y = 2x^2 - 12x + 7$. What is the distance between the vertex of the parabola and the point $(3, 4)$?

(A) 6
(B) 8
(C) 11
(D) 15

15. When a baseball is hit by a batter, the height of the ball, $h(t)$, at time t , is determined by the equation $h(t) = -16t^2 + 64t + 4$ where $t \geq 0$. For which interval of time, in seconds, is the height of the ball at least 52 feet above the playing field?

(A) $0.5 \leq t \leq 2.5$
(B) $1.0 \leq t \leq 3.0$
(C) $1.5 \leq t \leq 3.5$
(D) $2.0 \leq t \leq 4.0$

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Grid-in Response Directions

In questions 16–20, first solve the problem, and then enter your answer on the grid provided on the answer sheet. The instructions for entering your answers follow.

- First, write your answer in the boxes at the top of the grid.
- Second, grid your answer in the columns below the boxes.
- Use the fraction bar in the first row or the decimal point in the second row to enter fractions and decimals.

Write your answer in the boxes

Grid in your answer

Answer: $\frac{8}{15}$

Answer: 1.75

Answer: 100

Either position is acceptable

- Grid only one space in each column.
 - Entering the answer in the boxes is recommended as an aid in gridding but is not required.
 - The machine scoring your exam can read only what you grid, so you **must grid-in your answers correctly to get credit**.
 - If a question has more than one correct answer, grid-in only one of them.
 - The grid does not have a minus sign; so no answer can be negative.
 - A mixed number *must* be converted to an improper fraction or a decimal before it is gridded.
- Enter $1\frac{1}{4}$ as $5/4$ or 1.25 ; the machine will interpret $11/4$ as $\frac{11}{4}$ and mark it wrong.
- All decimals must be entered as accurately as possible.** Here are three acceptable ways of gridding

$$\frac{3}{11} = 0.272727 \dots$$

- Note that rounding to .273 is acceptable because you are using the full grid, but you would receive **no credit** for .3 or .27, because they are less accurate.

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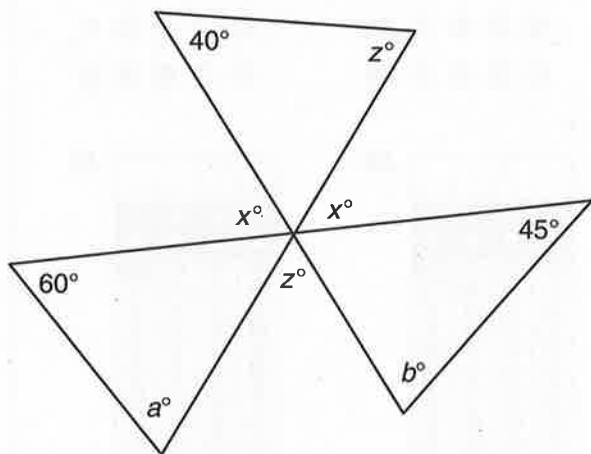
$$\frac{\frac{2}{3}a^2 - \frac{4}{9}a^2}{2a} = 4 \quad \text{where } a \neq 0$$

16. What is the value of a in the expression above?

$$\frac{2}{3}x - \frac{1}{4}y = 6$$

$$kx - \frac{1}{3}y = 8$$

17. If the system of equations above has an infinite number of solutions, what is the value of the constant k ?



18. In the figure above, the measures of the angles are as marked. What is the value of $a + b$?

19. The equation $W = 120I - 12I^2$ represents the power, W , in watts, of a 120-volt circuit having a resistance of 12 ohms when a current, I , is flowing through the circuit. What is the maximum power, in watts, that can be delivered in this circuit?
20. The graph of a line in the xy -plane passes through the points $(5, -5)$ and $(1, 3)$. The graph of a second line has a slope of 6 and passes through the point $(0, 1)$. If the two lines intersect at (p, q) , what is the value of $p + q$?

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MATHEMATICS TEST—CALCULATOR

55 MINUTES, 38 QUESTIONS

Turn to Section 4 of your answer sheet to answer the questions in this section.

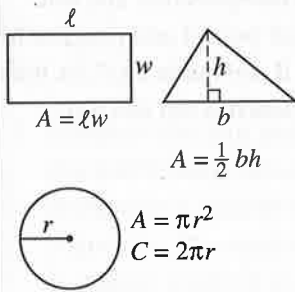
Directions: For questions 1–30, solve each problem and choose the best answer from the given options. Fill in the corresponding circle on your answer document. For questions 31–38, solve the problem and fill in the answer on the answer sheet grid.

Notes:

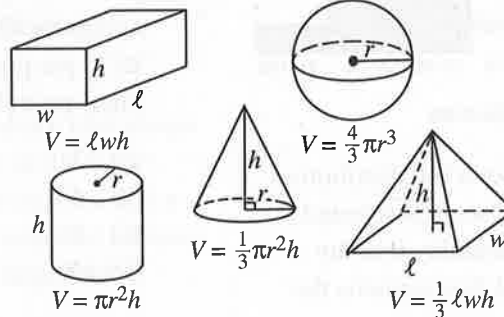
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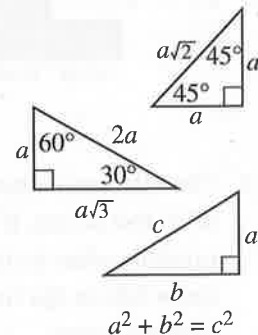
Area Facts



Volume Facts



Triangle Facts



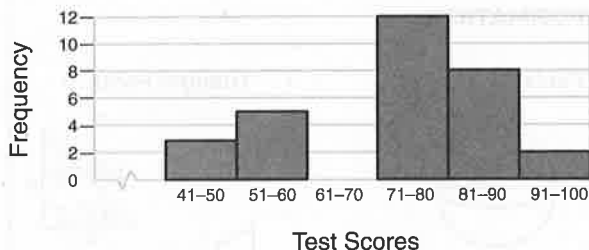
The arc of a circle contains 360° .

The arc of a circle contains 2π radians.

The sum of the measures of the angles in a triangle is 180° .

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- If three times 1 less than a number n is the same as two times the number increased by 14, what is the value of n ?
(A) 15
(B) 17
(C) 19
(D) 21
- George spent 25% of the money he had on lunch and 60% of the remaining money on dinner. If he then had \$9.00 left, how much money did he spend on lunch and dinner?
(A) \$19
(B) \$20
(C) \$21
(D) \$27

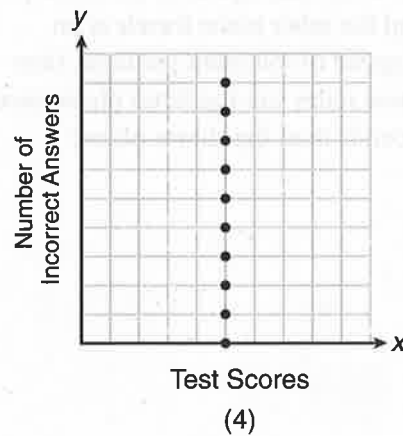
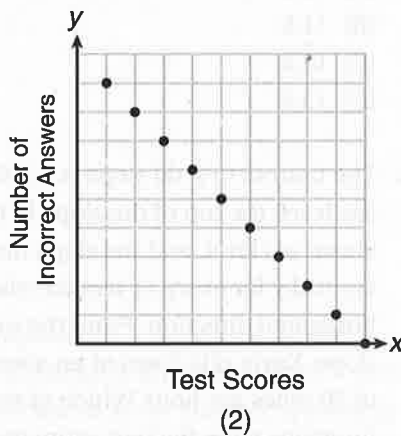
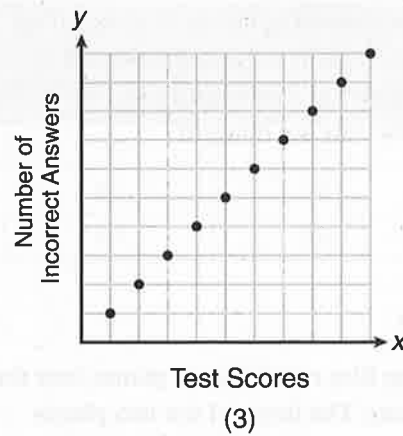
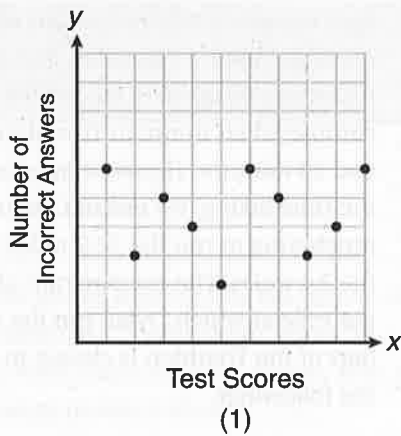


- The histogram above shows the distribution of 30 test scores. If a test score is selected at random, what is the probability that the score falls in the interval that contains the median score?
(A) $\frac{4}{15}$
(B) $\frac{2}{5}$
(C) $\frac{1}{2}$
(D) $\frac{3}{5}$
- The breakdown of a 500-milligram sample of a chemical compound in the bloodstream is represented by the function $p(n) = 500(0.8)^n$, where $p(n)$ represents the number of milligrams of the compound that remains at the end of n hours. Which of the following is true?
I. The amount of the compound present is decreasing by a constant amount.
II. Each hour the compound gets reduced by 20% of the amount present at the beginning of that hour.
III. Each hour the compound gets reduced by 80% of 500.
(A) I only
(B) II only
(C) I and III only
(D) II and III only
- Maggie's farm stand sold a total of 165 pounds of apples and peaches. She sold apples for \$1.75 per pound and peaches for \$2.50 per pound. If she made \$337.50, how many pounds of peaches did she sell?
(A) 11
(B) 18
(C) 65
(D) 100

Number of Weeks	1	2	3	4
Number of Downloads	120	180	270	405

- A computer program application developer released a new game app to be downloaded. The table above gives the number of downloads, y , for the first four weeks after the launch of the app. If w represents the number of weeks after the launch of the app, which equation best models these data?
(A) $y = 60(w + 1)$
(B) $y = 96(1.25)^w$
(C) $y = 80(1.50)^w$
(D) $y = 90w$

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7. Which of the four graphs above best shows the relationship between x and y if x represents a student score on a test and y represents the number of incorrect answers a student received on the same test?

- (A) Graph (1)
- (B) Graph (2)
- (C) Graph (3)
- (D) Graph (4)

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8. An animal boarding facility houses 3 dogs for every 2 cats. If the combined total of dogs and cats at the boarding facility is 250, how many cats are housed?

(A) 80
(B) 100
(C) 120
(D) 150

9. An airline flies two different planes over the same route. The faster of the two planes travels at an average speed of 540 miles per hour, and the other plane travels at an average speed of 450 miles per hour. How many more miles can the faster plane travel in 12 seconds than the slower plane?

(A) $\frac{1}{5}$
(B) $\frac{3}{10}$
(C) 9
(D) 18

$$\begin{aligned}x - 3y &= 2y + 7 \\x + 2 &= 3(y + 1)\end{aligned}$$

10. In the above system of equations, what is the value of $\frac{x}{y}$?

(A) $\frac{8}{3}$
(B) $\frac{11}{3}$
(C) 4
(D) 12

11. An Ironman Triathlon consists of swimming 2.4 miles, biking 112 miles, and running a marathon distance of 26.2 miles. Dylan completed an Ironman Triathlon in 12 hours and 30 minutes. He spent approximately half the time biking. He needed about 4 times as much time to run the 26.2 miles as to swim the 2.4 miles. The average rate of minutes per mile at which Dylan ran the marathon part of the Triathlon is closest to which of the following?

(A) 10.6
(B) 11.5
(C) 12.2
(D) 13.4

12. The bottom of a ski slope is 6,500 feet above sea level, the top of the slope is 11,000 feet above sea level, and the slope drops 5 feet vertically for every 11 feet traveled in the horizontal direction. From the top of the slope, Kayla skis down at an average speed of 30 miles per hour. Which of the following functions gives the best estimate for the distance above sea level, d , Kayla is t seconds after she begins her ski run where $6,500 < d < 11,000$? [Note: 5,280 feet = 1 mile]

(A) $d(t) = 11,000 - \left(\frac{150}{11}\right)t$
(B) $d(t) = 11,000 - 2.2t$
(C) $d(t) = 11,000 - 20t$
(D) $d(t) = 4,500 - 1,200t$

13. A gardener is planting two types of trees. One type is seven feet tall and grows at a rate of 8 inches per year. The other type is four feet tall and its rate of growth is 50% greater than the rate of the other tree. In how many years will the two trees grow to the same height?

(A) 6
(B) 7
(C) 8
(D) 9

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Age	Vaccination and Flu Status				Total
	Unvaccinated No Flu	Unvaccinated Got Flu	Vaccinated No Flu	Vaccinated Got Flu	
Under 21	6	4	8	2	20
21-50	17	15	22	14	68
Over 50	2	9	32	19	62

14. The table above summarizes the results of a survey taken at the end of last year's flu season. What fraction of the people who got the flu were unvaccinated?

- (A) $\frac{2}{3}$
 (B) $\frac{4}{9}$
 (C) $\frac{3}{8}$
 (D) $\frac{1}{12}$

15. The temperature, t , generated by an electrical circuit is represented by $t = f(m) = 0.3m^2$, where m is the number of moving parts. The resistance of the same circuit is represented by $r = g(t) = 150 + 5t$, where t is the temperature. What is the resistance in a circuit that has four moving parts?

- (A) 51
 (B) 156
 (C) 174
 (D) 8,670

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Comparison of Combined State and Local Spending on Education

State	Year					
	2011		2013		2015	
	Education Spending	Population	Education Spending	Population	Education Spending	Population
California	453,480.7	37.7	447,531.1	38.4	454,003.1	39.2
New York	300,031.9	19.5	306,395.8	19.7	316,104.0	19.8
Texas	221,155.9	25.7	226,805.0	26.5	252,655.5	27.4
Florida	163,070.8	19.1	157,010.2	19.6	162,548.3	20.2
Illinois	129,543.3	12.9	132,848.8	12.9	140,072.6	12.9

Questions 16 and 17 refer to the above table, that shows the population (in millions) and education spending (in millions) and by state for each of the states listed for the years 2011, 2013, and 2015.

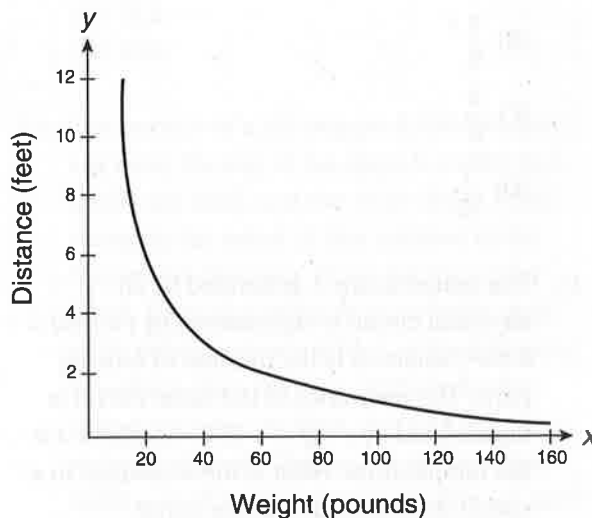
16. Which of the following best approximates the average rate of change in education spending in Texas from 2011 to 2015?

(A) 3.2 billion per year
(B) 6.3 billion per year
(C) 7.9 billion per year
(D) 10.5 billion per year

17. Based on the data in the table, which of the following must be true?

I. In 2015 per capita (per person) spending on education in Illinois was greater than per capita spending on education in Texas.
II. Per capita spending on education in Florida declined in 2015 compared to 2011 spending.
III. California had the highest per capita spending in education for each year.
(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II, and III

18.



The graph above shows the relationship between a person's weight and the distance that the person must sit from the center of a seesaw to make it balanced. Which of the following best represents the equation of this graph?

(A) $y = 12x^2$
(B) $y = -120x$
(C) $y = 120\left(\frac{1}{2}\right)^x$
(D) $y = \frac{120}{x}$

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Average Annual Salary Range By Highest Level of Degree Earned				
Highest Degree Earned	Average Annual Salary			Total
	Less than \$35,000	\$35,000 to \$70,000	More than \$70,000	
High School	21	15	3	39
Two Year College	12	24	2	33
Four Year College	18	41	29	93
Graduate School	1	28	46	75
Total	52	108	80	240

19. The table above summarizes the results of a survey taken in which 240 adults were asked about their education level and current annual salary. If a participant who reported earning \$35,000 or more per year is selected at random, what is the best estimate of the probability that the person does *not* have a graduate school degree?

(A) 0.31
(B) 0.40
(C) 0.60
(D) 0.69

20. If the sum of 10 dimes, 5 nickels, and x quarters equals \$5.25, what is the value of x ?

(A) 8
(B) 10
(C) 16
(D) 22

Students at Washington High School	Male	Female	Total
Taking AP Classes	56	72	128
Not Taking AP Classes	23	26	49
Total	79	98	177

21. The table above gives the number of male and female students at Washington High School who are taking Advanced Placement (AP) classes and those who are not. What is the proportion of the total number of students at the school who are both male and NOT taking AP classes?

(A) $\frac{23}{177}$
(B) $\frac{79}{177}$
(C) $\frac{23}{49}$
(D) $\frac{23}{56}$

22. A travel agency sells ship cruises for a popular cruise line. Historically, 135 cruises can be sold when the price is \$950 per person. If the price drops to the minimum allowed by the cruise line of \$725 per person, 180 cruises can be sold. If the number of cruises sold increases at a constant rate as the price p decreases, where $p \geq 725$, which of the following functions best models the situation described?

(A) $f(p) = -\frac{1}{29}p + 205$
(B) $f(p) = -\frac{1}{19}p + 1,135$
(C) $f(p) = -5p + 4,885$
(D) $f(p) = -\frac{1}{5}p + 325$

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- I. The coordinates of the center are $(2, -3)$.
 II. The coordinates of the center are $(-2, 3)$.
 III. The length of the radius is $5\sqrt{2}$.
 IV. The length of the radius is 50.

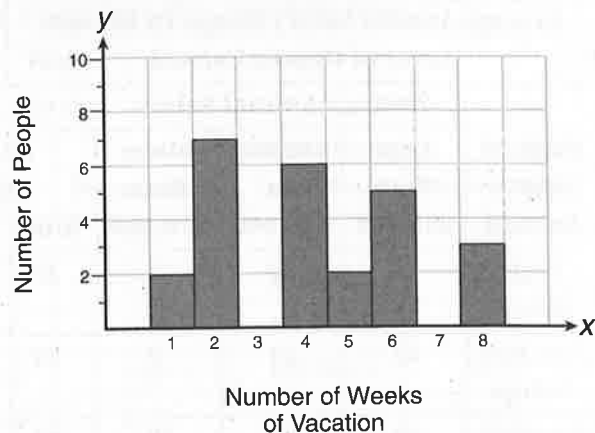
23. If an equation of a circle is $x^2 + 4x + y^2 - 6y = 37$, which of the statements above are true?

- (A) I and III
 (B) I and IV
 (C) II and III
 (D) II and IV

$$f(x) = \frac{x^4 + 2x^3 - 3x^2 + 4x + 12}{x + 3}$$

24. Which of the following functions is equivalent to the function above for all values of x for which function f is defined?

- (A) $g(x) = x^3 - x^2 + 4$
 (B) $g(x) = x^2 - x + 4$
 (C) $g(x) = x^3 - x^2 + 4x$
 (D) $g(x) = x^4 + 2x^3 - 3x^2 + 4$



25. The histogram above shows the results of a survey taken of 25 individuals who were polled about how many weeks of vacation per year they receive. Which of the following is closest to the average (arithmetic mean) number of weeks of vacation per individual?

- (A) 2
 (B) 3
 (C) 4
 (D) 5

26. If $p(x)$ is a polynomial function and $p(-1) = 3$, which statement is true?

- (A) The remainder when $p(x)$ is divided by $x - 3$ is -1 .
 (B) The remainder when $p(x)$ is divided by $x + 3$ is -1 .
 (C) The remainder when $p(x)$ is divided by $x - 1$ is 3.
 (D) The remainder when $p(x)$ is divided by $x + 1$ is 3.

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$$y = \frac{3}{h-2}x + 5$$

$$hy - 8x = 5$$

27. For what value of h does the system of equations above have no solution?
- (A) $\frac{16}{5}$
 (B) $\frac{13}{8}$
 (C) $\frac{11}{15}$
 (D) $\frac{5}{8}$
28. A troy ounce is a unit of mass used for precious metals such as gold. There are 12 troy ounces in a troy pound and a troy pound is equivalent to 373.2 grams. If the density of gold is 19.3 grams per cubic centimeter, which of the following is closest to the number of cubic centimeters in the volume of a block of gold with a mass of 5 troy ounces? [Note: density is mass divided by volume]
- (A) 7
 (B) 8
 (C) 9
 (D) 10
29. A researcher is conducting a survey for which she currently has a 93% confidence level. What would be two actions that she could take that would be most likely to increase the confidence level in her survey results?
- (A) Increase the sample size and modify the design of the survey to increase the standard deviation.
 (B) Increase the sample size and modify the design of the survey to decrease the standard deviation.
 (C) Decrease the sample size and increase the randomness of the survey sample.
 (D) Modify the design of the survey to increase the standard deviation and decrease the randomness of the survey sample.
30. The coordinates of the vertex of a parabola in the xy -plane are $(-4, k)$. If the y -intercept of the parabola is 12 and the parabola passes through the point $(-3, 7)$, what is the value of k ?
- (A) $\frac{20}{3}$
 (B) $\frac{16}{5}$
 (C) $\frac{14}{3}$
 (D) $\frac{12}{5}$

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Grid-in Response Directions

In questions 31–38, first solve the problem, and then enter your answer on the grid provided on the answer sheet. The instructions for entering your answers follow.

- First, write your answer in the boxes at the top of the grid.
- Second, grid your answer in the columns below the boxes.
- Use the fraction bar in the first row or the decimal point in the second row to enter fractions and decimals.

Write your answer in the boxes

Answer: $\frac{8}{15}$

8	/	1	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	0	0	0
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Grid in your answer

Answer: 1.75

1	.	7	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Answer: 100

1	0	0
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	0	0
1	1	1
2	2	2
3	3	3

1	0	0
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	0	0
1	1	1
2	2	2
3	3	3

Either position is acceptable

- Grid only one space in each column.
- Entering the answer in the boxes is recommended as an aid in gridding but is not required.
- The machine scoring your exam can read only what you grid, so you **must grid-in your answers correctly to get credit**.
- If a question has more than one correct answer, grid-in only one of them.
- The grid does not have a minus sign; so no answer can be negative.
- A mixed number *must* be converted to an improper fraction or a decimal before it is gridded.
Enter $1\frac{1}{4}$ as $5/4$ or 1.25 ; the machine will interpret $11/4$ as $\frac{11}{4}$ and mark it wrong.
- All decimals must be entered as accurately as possible.** Here are three acceptable ways of gridding

$$\frac{3}{11} = 0.272727 \dots$$

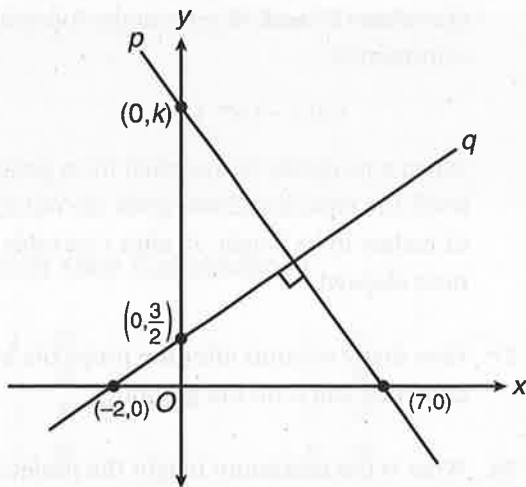
3	/	1	1
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

.	2	7	2
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

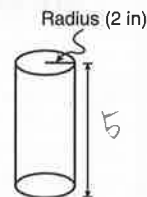
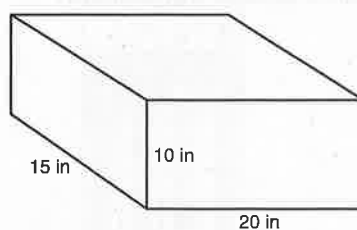
.	2	7	3
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

- Note that rounding to .273 is acceptable because you are using the full grid, but you would receive **no credit** for .3 or .27, because they are less accurate.

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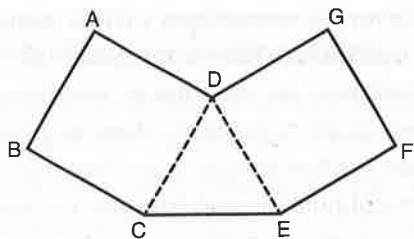


31. In the xy -plane above, line p is perpendicular to line q . What is the value of k ?
32. Eleven seconds after a deep sea diver jumps into the ocean he is 69 feet below sea level and 28 seconds later, he is 195 feet below sea level. If he is descending under water at a constant rate, how many feet below sea level will he be 1.5 minutes after his initial descent?
33. What is a possible value of x that satisfies $9 < 4x - |-3| < 10$?
34. One way of estimating a wildlife population of interest is to draw a sample of the population, tag the animals, and then return them to the population. Then, at a later date, draw another sample at random from the same population and compare the results. An ecologist using this methodology captures, tags, and then returns 198 fish to a lake. Three months later the ecologist captures a sample of 135 of the same type of fish, of which 22 were tagged. What would be the ecologist's best estimate for the number of fish of that type that are in the lake?



35. In the figure above, a rectangular container with the dimensions 10 inches by 15 inches by 20 inches is to be filled with water, using a cylindrical cup whose radius is 2 inches and whose height is 5 inches. What is the maximum number of full cups of water that can be placed into the container without the water overflowing the container?

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36. A sterling silver pendant is being designed to have the shape of polygon $ABCEFGD$ shown above where $ABCD$ and $EFGD$ are squares and triangle CDE is equilateral. If the area of $\triangle CDE$ is $\frac{27}{\sqrt{3}}$ square centimeters, what is the total linear distance around the pendant?

Questions 37 and 38 refer to the following information.

$$h(t) = -4.9t^2 + 88.2t$$

When a projectile is launched from ground level, the equation above gives the number of meters in its height, h , after t seconds have elapsed.

37. How many seconds after the projectile is launched will it hit the ground?
38. What is the maximum height the projectile reaches, correct to the *nearest meter*?

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ANSWER KEY

Practice Test 2

Math (No Calculator)

1. **D**
2. **D**
3. **B**
4. **D**

5. **C**
6. **B**
7. **D**
8. **C**

9. **B**
10. **A**
11. **B**
12. **B**

13. **D**
14. **D**
15. **B**

16.

		3	6
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	1	1	1
2	2	2	2
3	3	<input checked="" type="radio"/>	3
4	4	4	4
5	5	5	5
6	6	6	<input checked="" type="radio"/>
7	7	7	7
8	8	8	8
9	9	9	9

17.

	8	/	9
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	<input checked="" type="radio"/>	8	8
9	9	9	<input checked="" type="radio"/>

18.

	1	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	<input checked="" type="radio"/>	1	1
2	2	2	2
3	3	3	3
4	4	<input checked="" type="radio"/>	4
5	5	5	<input checked="" type="radio"/>
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

19.

	3	0	0
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
1	1	1	1
2	2	2	2
3	<input checked="" type="radio"/>	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

20.

	9	/	2
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	1	1	1
2	2	2	<input checked="" type="radio"/>
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	<input checked="" type="radio"/>	9	9

