

Form Codes AEQY, BWQY, CFQY

SAT Reasoning Test™


Question-and-Answer Service
Jan/ 2007 Administration

INSIDE:

- Test questions and correct answers
- The difficulty level for each question
- Your essay prompt and all other essay prompts administered on your test day
- Instructions for scoring your test
- Suggestions for using this report to understand your strengths and weaknesses

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 **CollegeBoard SAT**
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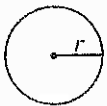
SECTION 2
Time — 25 minutes
18 Questions

Directions: This section contains two types of questions. You have 25 minutes to complete both types. For questions 1-8, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratchwork.

Notes

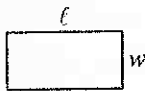
1. The use of a calculator is permitted.
2. All numbers used are real numbers.
3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
4. Unless otherwise specified, the domain of any function f is assumed to be the set of all real numbers x for which $f(x)$ is a real number.

Reference Information

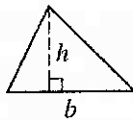


$$A = \pi r^2$$

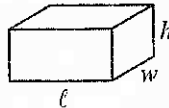
$$C = 2\pi r$$



$$A = \ell w$$



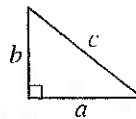
$$A = \frac{1}{2}bh$$



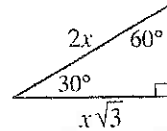
$$V = \ell wh$$



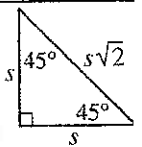
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



Special Right Triangles



The number of degrees of arc in a circle is 360.

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

1. If $3x = 0$, what is the value of $1 + x + x^2$?
 - (A) $\frac{7}{9}$
 - (B) 1
 - (C) $\frac{13}{9}$
 - (D) 7
 - (E) 13
2. The diameter of circle A is 3 times the diameter of circle B . What is the ratio of the radius of circle A to the radius of circle B ?
 - (A) 9 : 1
 - (B) 6 : 1
 - (C) 3 : 4
 - (D) 3 : 2
 - (E) 3 : 1

GO ON TO THE NEXT PAGE



3. N is a set of numbers whose average (arithmetic mean) is 3. M is a set that is generated by doubling each number in N . What is the average of the numbers in set M ?

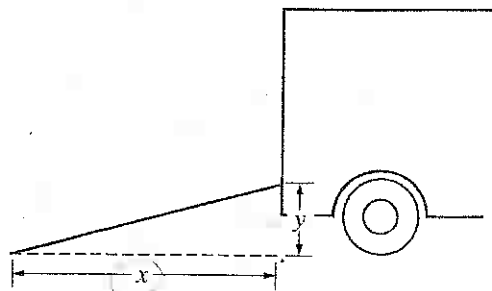
(A) $\frac{1}{3}$
 (B) 2
 (C) 3
 (D) 6
 (E) 9

4. If P , R , and T are digits in the positive three-digit integer PRT , what is the decimal equivalent of $PRT \times 10^{-2}$?

(A) $0.0PRT$
 (B) $0.PRT$
 (C) $P.RT$
 (D) $PR.T$
 (E) $PR.T00$

5. If $k + n < k$, which of the following must be true?

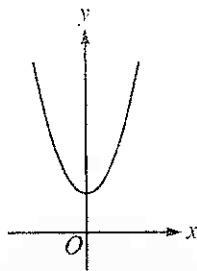
(A) $k > 0$
 (B) $k = 0$
 (C) $k < 0$
 (D) $n > 0$
 (E) $n < 0$



Note: Figure not drawn to scale.


6. A ramp is extended from a truck to the ground, as shown in the figure above. The ramp has a slope of $\frac{7}{16}$. If y is 3.5 feet, what is x , in feet?
- (A) 8
 (B) 12.5
 (C) 20
 (D) 24.5
 (E) 32

GO ON TO THE NEXT PAGE



7. The graph above is a parabola whose equation is $y = -ax^2 + 2$, where a is a constant. If $y = \frac{a}{3}x^2 + 2$ is graphed on the same axes, which of the following best describes the resulting graph as compared with the graph above?
- (A) It will be narrower.
 (B) It will be wider.
 (C) It will be moved to the left.
 (D) It will be moved to the right.
 (E) It will be moved 3 units downward.

8. Meredith has a red hat, a blue hat, and a white hat. She also has three sweaters—one red, one blue, and one white—and three pairs of jeans—one red, one blue, and one white. Meredith wants to wear a red, white, and blue outfit consisting of one hat, one sweater, and one pair of jeans. How many different possibilities does she have?
- (A) 3
 (B) 6
 (C) 9
 (D) 12
 (E) 27

GO ON TO THE NEXT PAGE 



Directions: For Student-Produced Response questions 9-18, use the grids at the bottom of the answer sheet page on which you have answered questions 1-8.

Each of the remaining 10 questions requires you to solve the problem and enter your answer by marking the circles in the special grid, as shown in the examples below. You may use any available space for scratchwork.

Write answer in boxes.

Grid in result.

Answer: $\frac{7}{12}$

	7	/	1	2
	○	○	○	○
	○	●	○	○
	○	○	○	○
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
5	○	○	○	○
6	○	○	○	○
7	○	○	○	○
8	○	○	○	○
9	○	○	○	○

Fraction line

Answer: 2.5

	2	.	5
	○	○	○
	○	○	○
	○	○	○
1	○	○	○
2	○	○	○
3	○	○	○
4	○	○	○
5	○	○	○
6	○	○	○
7	○	○	○
8	○	○	○
9	○	○	○

Decimal point

Answer: 201

Either position is correct.

	2	0	1
	○	○	○
	○	○	○
	○	○	○
1	○	○	○
2	○	○	○
3	○	○	○
4	○	○	○

	2	0	1
	○	○	○
	○	○	○
	○	○	○
1	○	○	○
2	○	○	○
3	○	○	○
4	○	○	○

Note: You may start your answers in any column, space permitting. Columns not needed should be left blank.

- Mark no more than one circle in any column.
- Because the answer sheet will be machine-scored, you will receive credit only if the circles are filled in correctly.
- Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately.
- Some problems may have more than one correct answer. In such cases, grid only one answer.
- No question has a negative answer.
- Mixed numbers such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If $\frac{31}{2}$ is gridded, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)

- **Decimal Answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid. For example, if you obtain an answer such as 0.6666..., you should record your result as .666 or .667. A less accurate value such as .66 or .67 will be scored as incorrect.

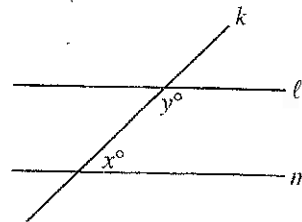
Acceptable ways to grid $\frac{2}{3}$ are:

	2	/	3
	○	○	○
	○	○	○
	○	○	○
1	○	○	○
2	○	○	○
3	○	○	○
4	○	○	○
5	○	○	○
6	○	○	○

	.	6	6	6
	○	○	○	○
	○	○	○	○
	○	○	○	○
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
5	○	○	○	○
6	○	○	○	○

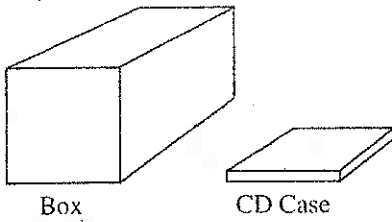
	.	6	6	7
	○	○	○	○
	○	○	○	○
	○	○	○	○
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
5	○	○	○	○
6	○	○	○	○

When twice a certain number is increased by 5, the result is 14. What is the number?



10. In the figure above, $\ell \parallel m$ and $y = 3x$. What is the value of y ?

GO ON TO THE NEXT PAGE



11. The inside dimensions of the rectangular box shown above are 4 inches by 4 inches by 8 inches. What is the maximum number of CD cases like the one shown that will fit inside the box if each CD case has outside dimensions of 4 inches by 4 inches by $\frac{1}{4}$ inch?

PROFITS OF CERTAIN STORES

	Year 1	Year 2
Store A	\$ 5,000	\$ 6,200
Store B	6,000	7,350
Store C	10,000	12,700
TOTAL	\$21,000	\$26,250

13. The table above lists the profits of 3 stores in 2 consecutive years. What was the average (arithmetic mean) increase in profit, in dollars, for these 3 stores from year 1 to year 2? (Disregard the \$ sign when gridding your answer.)

$$f(x) = |3x - 17|$$

14. For the function defined above, what is one possible value of a for which $f(a) < a$?

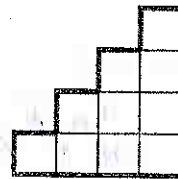
12. If $\frac{3x + y}{y} = \frac{6}{5}$, what is the value of $\frac{x}{y}$?

GO ON TO THE NEXT PAGE

15. From a jar containing 50 pieces of candy, of which 25 are red and 25 are green, Ari has taken 3 red and 4 green pieces. He takes an additional 13 pieces from the jar. What is the least number of these additional pieces that must be red in order for Ari to have more red candies than green candies among all the pieces he has taken?

16. A positive integer is said to be "tri-factorable" if it is the product of three consecutive integers. How many positive integers less than 1,000 are tri-factorable?

17. The cost of a telephone call using long-distance carrier *A* is \$1.00 for any time up to and including 20 minutes and \$0.07 per minute thereafter. The cost using long-distance carrier *B* is \$0.06 per minute for any amount of time. For a call that lasts t minutes, the cost using carrier *A* is the same as the cost using carrier *B*. If t is a positive integer greater than 20, what is the value of t ?



18. The figure above shows an arrangement of 10 squares, each with side of length k inches. The perimeter of the figure is p inches. The area of the figure is a square inches. If $p = a$, what is the value of k ?

STOP

If you finish before time is called, you may check your work on this section only. Do not turn to any other section in the test.



SECTION 6

Time — 25 minutes

20 Questions

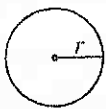
Turn to Section 6 (page 6) of your answer sheet to answer the questions in this section.

Directions: For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratchwork.

Notes

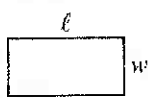
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Reference Information

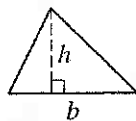


$$A = \pi r^2$$

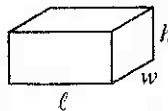
$$C = 2\pi r$$



$$A = \ell w$$



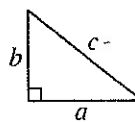
$$A = \frac{1}{2}bh$$



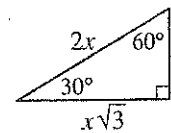
$$V = \ell wh$$



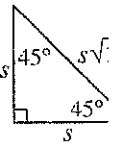
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



Special Right Triangles



The number of degrees of arc in a circle is 360.

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

1, 4, 10, t , 46, ...

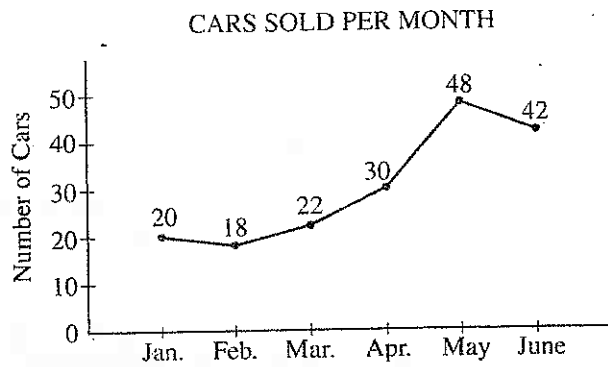
- In the sequence above, the first term is 1 and each term after the first is 2 more than twice the previous term. What is the value of t ?
 - 12
 - 14
 - 20
 - 22
 - 24

- A machine can fill 24 cartons in 1 hour. At this rate how many cartons can the machine fill in 5 minutes
 - Two
 - Three
 - Five
 - Six
 - Eight

GO ON TO THE NEXT PAGE



Questions 3-4 refer to the following graph.



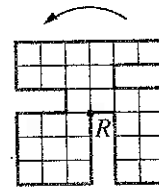
The line graph above shows the number of cars Cathy sold in each of the first six months of 2003.

3. Cathy sold how many more cars in the month of May than in the months of January and February combined?

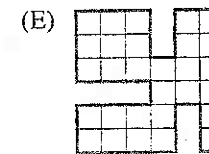
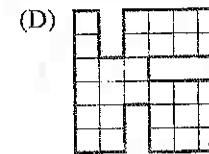
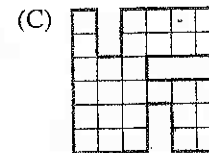
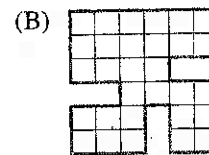
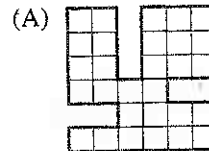
(A) 10
(B) 15
(C) 20
(D) 25
(E) 30

4. If the car sales data from these six months were illustrated by a circle graph, what would be the measure of the central angle of the sector that represents the month of April?

(A) 30°
(B) 54°
(C) 60°
(D) 108°
(E) 120°



5. If the figure above were rotated counterclockwise 90° about point R , which of the following would be the result?



GO ON TO THE NEXT PAGE



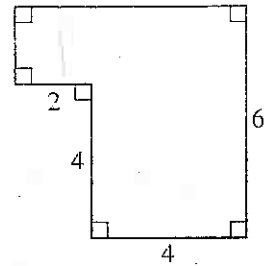
6. If 3 more than twice a number is equal to 10, what is 4 times the number?

- (A) $3\frac{1}{2}$
 (B) 7
 (C) $10\frac{1}{2}$
 (D) 14
 (E) $17\frac{1}{2}$

$a, 2a, 4a, 8a$

7. If $a < 0$, which of the four numbers above is the greatest?

- (A) a
 (B) $2a$
 (C) $4a$
 (D) $8a$
 (E) It cannot be determined from the information given.



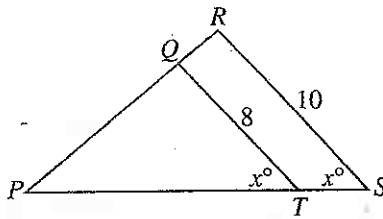
8. What is the area of the six-sided figure above?

- (A) 26
 (B) 28
 (C) 30
 (D) 34
 (E) 40

9. If $(x - 2)^2 = 25$ and $x < 0$, what is the value of x ?

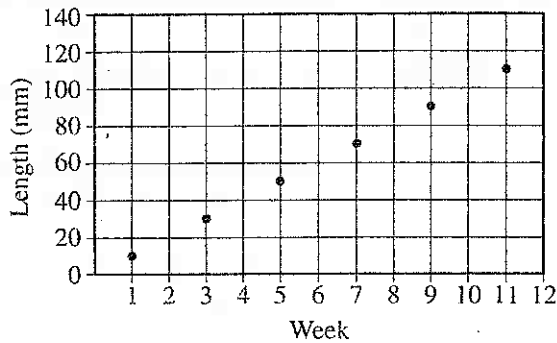
- (A) -23
 (B) -7
 (C) -5
 (D) -3
 (E) -2

GO ON TO THE NEXT PAGE



10. In the figure above, what is the value of $\frac{PT}{PS}$?

- (A) $\frac{1}{5}$
 (B) $\frac{1}{4}$
 (C) $\frac{2}{5}$
 (D) $\frac{1}{2}$
 (E) $\frac{4}{5}$



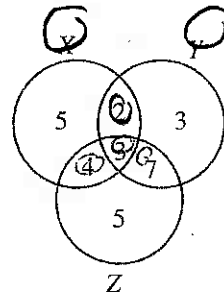
11. A biology teacher graphed the length of a fish over time, and the results are shown above. If L represents the length of the fish in millimeters and W represents the number of the week, which of the following equations best describes the data shown?

- (A) $L = W$
 (B) $L = 10$
 (C) $L = W + 10$
 (D) $L = 10W$
 (E) $L = 10W + 10$

5, 6, 5, 6, 7, 5, 5, n , 6

12. For the numbers listed above, the only mode is 5 and the median is 6. Each of the following could be the value of n EXCEPT

- (A) 6
 (B) 7
 (C) 8
 (D) 9
 (E) 10



13. In the Venn diagram above, the number in each region indicates how many elements are in that region. How many elements are in the intersection of sets Y and Z ?

- (A) 3
 (B) 7
 (C) 10
 (D) 16
 (E) 25

GO ON TO THE NEXT PAGE



14. If $m = t^3$ for any positive integer t , and if $w = m^2 + m$, what is w in terms of t ?

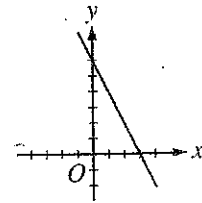
- (A) $t^2 + t$
 (B) t^3
 (C) $t^3 + t$
 (D) $t^5 + t^3$
 (E) $t^6 + t^3$

15. For all positive integers x , let $x\blacktriangle$ be defined to be $(x - 1)(x + 1)$. Which of the following is equal to $6\blacktriangle - 5\blacktriangle$?

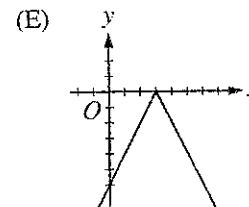
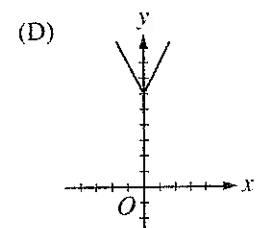
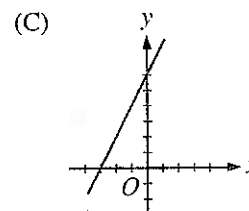
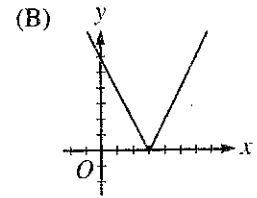
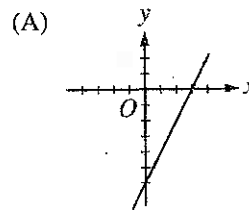
- (A) $2\blacktriangle + 1\blacktriangle$
 (B) $3\blacktriangle + 2\blacktriangle$
 (C) $4\blacktriangle + 3\blacktriangle$
 (D) $5\blacktriangle + 4\blacktriangle$
 (E) $6\blacktriangle + 5\blacktriangle$

16. If $\frac{x^2}{y}$ is an integer, but $\frac{x}{y}$ is not an integer, which of the following could be the values of x and y ?

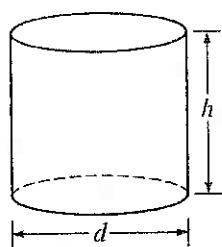
- (A) $x = 1, y = 1$
 (B) $x = 3, y = 2$
 (C) $x = 4, y = 2$
 (D) $x = 6, y = 4$
 (E) $x = 9, y = 3$



17. The equation of the line above is $y = -2x + 6$. Which of the following is the graph of $y = |-2x + 6|$?



GO ON TO THE NEXT PAGE



18. The right circular cylinder above has diameter d and height h . Of the following expressions, which represents the volume of the smallest rectangular box that completely contains the cylinder?

- (A) dh
 (B) d^2h
 (C) dh^2
 (D) d^2h^2
 (E) $(d + h)^2$

19. The square of x is equal to 4 times the square of y . If x is 1 more than twice y , what is the value of x ?

- (A) -4
 (B) $-\frac{1}{2}$
 (C) $-\frac{1}{4}$
 (D) $\frac{1}{4}$
 (E) $\frac{1}{2}$

20. In the xy -coordinate plane, lines ℓ and q are perpendicular. If line ℓ contains the points $(0, 0)$ and $(2, 1)$, and line q contains the points $(2, 1)$ and $(0, t)$, what is the value of t ?

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

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.



SECTION 9

Time — 20 minutes

16 Questions

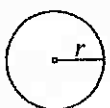
Turn to Section 9 (page 7) of your answer sheet to answer the questions in this section.

Directions: For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratchwork.

Notes

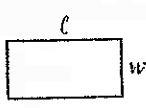
- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
- Unless otherwise specified, the domain of any function f is assumed to be the set of all real numbers x for which $f(x)$ is a real number.

Reference Information

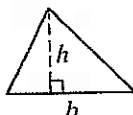


$$A = \pi r^2$$

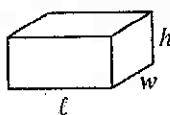
$$C = 2\pi r$$



$$A = \ell w$$



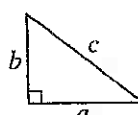
$$A = \frac{1}{2}bh$$



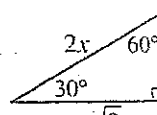
$$V = \ell wh$$



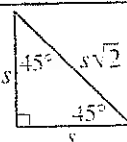
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



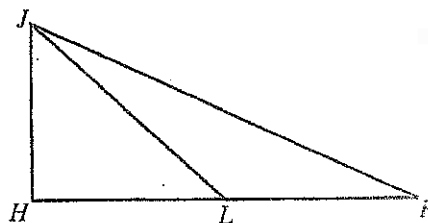
Special Right Triangles



The number of degrees of arc in a circle is 360.
The sum of the measures in degrees of the angles of a triangle is 180.

1. If a film takes 90 minutes to show, what fraction of the film is completed 15 minutes after it begins?

- (A) $\frac{1}{9}$
(B) $\frac{1}{6}$
(C) $\frac{1}{5}$
(D) $\frac{1}{4}$
(E) $\frac{1}{3}$



2. In $\triangle HJK$ above, $\angle JHK$ is a right angle. Which of the following lengths is greatest?

- (A) HJ
(B) HK
(C) HL
(D) JK
(E) JL

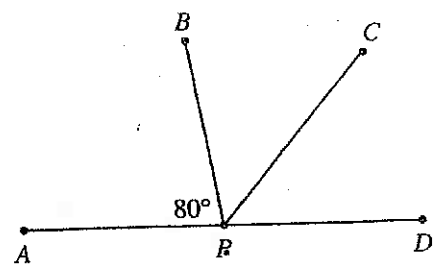
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n	1	2	3	4	5	6
$f(n)$	7	13	19	p	31	37

3. The table above defines a linear function. What is the value of p ?
- (A) 21
 - (B) 23
 - (C) 25
 - (D) 27
 - (E) 29

4. Charlie has built houses for 5 years less than twice as long as Maly has. If Maly has built houses for n years, which of the following expressions represents the number of years that Charlie has built houses?
- (A) $n - 5$
 - (B) $n + 5$
 - (C) $2n - 5$
 - (D) $2n + 5$
 - (E) $5 - 2n$



5. In the figure above, P lies on \overline{AD} and \overline{PC} bisects $\angle BPD$. What is the measure of $\angle CPD$?
- (A) 40°
 - (B) 50°
 - (C) 60°
 - (D) 70°
 - (E) 80°

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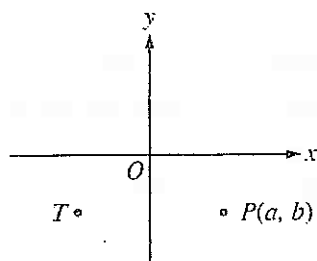


6. If x represents an odd integer, which of the following represents the next odd integer greater than x ?

(A) $x - 1$
 (B) $x + 1$
 (C) $x + 2$
 (D) $x + 3$
 (E) $2x - 1$

8. A box contains wood beads, red glass beads, and blue glass beads. The number of glass beads is 4 times the number of wood beads. If one bead is to be chosen at random from the box, the probability that a red glass bead will be chosen is 3 times the probability that a blue glass bead will be chosen. If there are 12 red glass beads in the box, what is the total number of beads in the box?

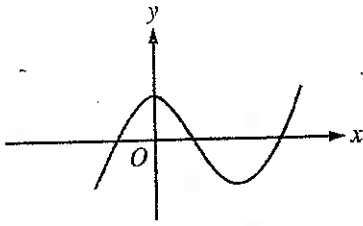
(A) 20
 (B) 45
 (C) 48
 (D) 60
 (E) 90



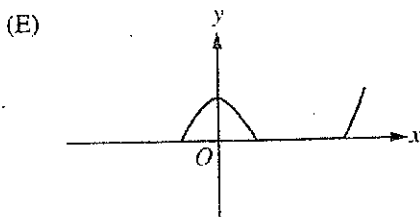
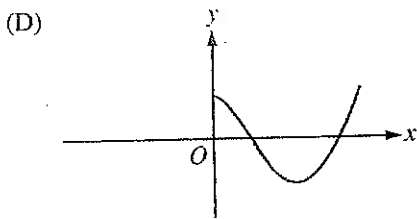
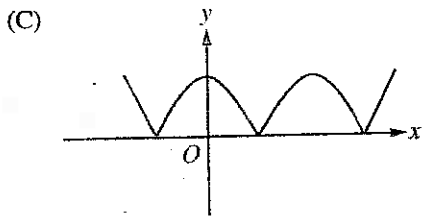
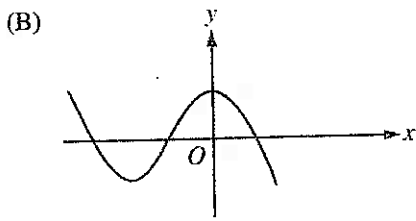
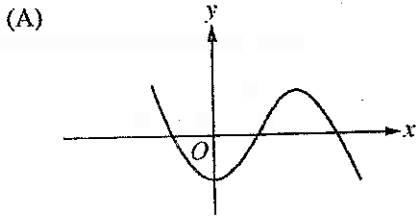
7. In the figure above, point T is the same distance from O as point P is from O . Which of the following could be the coordinates of point T ?

(A) $(-a, b)$
 (B) $(a, -b)$
 (C) $(-b, -a)$
 (D) $(-b, a)$
 (E) (b, a)

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9. Which of the following graphs is the reflection of the graph above about the x -axis?

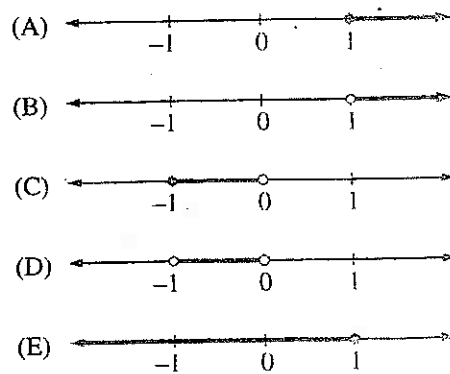


10. If $(x + y)^2 = 100$ and $(x - y)^2 = 16$, what is the value of xy ?

- (A) 6
(B) 10
(C) 21
(D) 25
(E) 29

$$-1 \leq 4x - 5$$

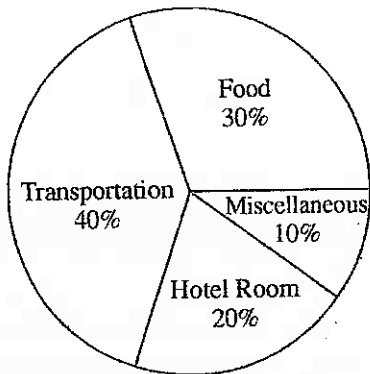
11. Which of the following represents all values of x that satisfy the inequality above?



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TOM'S TRIP EXPENSES



15. The graph above shows the distribution of Tom's \$240 trip expenses. The amount Tom paid for the hotel room was only part of the total hotel room cost, because he shared the cost of the room equally with 3 other people. What was the total cost of the hotel room?
- (A) \$20
 (B) \$80
 (C) \$144
 (D) \$192
 (E) \$240

16. On a square gameboard that is divided into n rows of n squares each, k of these squares lie along the boundary of the gameboard. Which of the following is a possible value for k ?

- (A) 10
 (B) 25
 (C) 34
 (D) 42
 (E) 52

STOP

If you finish before time is called, you may check your work on this section only.
 Do not turn to any other section in the test.