

Effective through the **2011–2012** testing year.



# PREPARING

## for the ACT

### **What's Inside:**

- Full-Length Practice Tests, including a Writing Test
- Information about the Optional Writing Test
- Strategies to Prepare for the Tests
- What to Expect on Test Day



This booklet is provided free of charge.

Esta publicación también se puede ver o descargar en español en  
[www.actstudent.org/testprep/index.html](http://www.actstudent.org/testprep/index.html).





### MATHEMATICS TEST

60 Minutes—60 Questions

**DIRECTIONS:** Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose,

but some of the problems may best be done without using a calculator.

Note: Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

1.  $|7 - 3| - |3 - 7| = ?$

- A. -8
- B. -6
- C. -4
- D. 0
- E. 8

2. A consultant charges \$45 for each hour she works on a consultation, plus a flat \$30 consulting fee. How many hours of work are included in a \$210 bill for a consultation?

- F.  $2\frac{4}{5}$
- G. 4
- H.  $4\frac{2}{3}$
- J.  $5\frac{1}{2}$
- K. 7

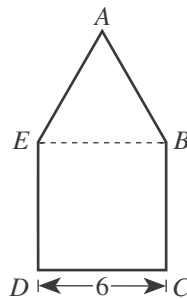
3. Vehicle A averages 14 miles per gallon of gasoline, and Vehicle B averages 36 miles per gallon of gasoline. At these rates, how many more gallons of gasoline does Vehicle A need than Vehicle B to make a 1,008-mile trip?

- A. 25
- B. 28
- C. 44
- D. 50
- E. 72

4.  $t^2 - 59t + 54 - 82t^2 + 60t$  is equivalent to:

- F.  $-26t^2$
- G.  $-26t^6$
- H.  $-81t^4 + t^2 + 54$
- J.  $-81t^2 + t + 54$
- K.  $-82t^2 + t + 54$

5. The figure below is composed of square  $BCDE$  and equilateral triangle  $\triangle ABE$ . The length of  $\overline{CD}$  is 6 inches. What is the perimeter of  $ABCDE$ , in inches?



- A. 18
- B. 24
- C. 30
- D. 42
- E. 45

6. The expression  $(4z + 3)(z - 2)$  is equivalent to:

- F.  $4z^2 - 5$
- G.  $4z^2 - 6$
- H.  $4z^2 - 3z - 5$
- J.  $4z^2 - 5z - 6$
- K.  $4z^2 + 5z - 6$

7. If 40% of a given number is 8, then what is 15% of the given number?

- A. 1.2
- B. 1.8
- C. 3.0
- D. 5.0
- E. 6.5

8. The 6 consecutive integers below add up to 447.

$$\begin{aligned} &x - 2 \\ &x - 1 \\ &x \\ &x + 1 \\ &x + 2 \\ &x + 3 \end{aligned}$$

What is the value of  $x$ ?

- F. 72
- G. 73
- H. 74
- J. 75
- K. 76

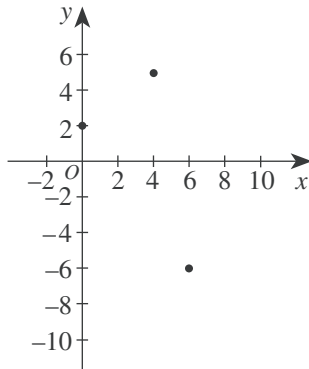
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9. In the standard  $(x,y)$  coordinate plane, point  $M$  with coordinates  $(5,4)$  is the midpoint of  $\overline{AB}$ , and  $B$  has coordinates  $(7,3)$ . What are the coordinates of  $A$  ?

- A.  $(17,11)$
- B.  $(9, 2)$
- C.  $(6, 3.5)$
- D.  $(3, 5)$
- E.  $(-3,-5)$

10. Rectangle  $ABCD$  has vertices  $A(4,5)$ ,  $B(0,2)$ , and  $C(6,-6)$ . These vertices are graphed below in the standard  $(x,y)$  coordinate plane. What are the coordinates of vertex  $D$  ?

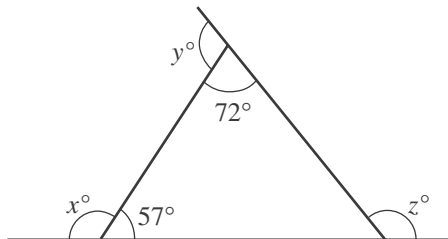


- F.  $(10,-3)$
- G.  $(9,-2)$
- H.  $(8, 2)$
- J.  $(7, 1)$
- K.  $(2,-9)$

11. Daisun owns 2 sportswear stores (X and Y). She stocks 3 brands of T-shirts (A, B, and C) in each store. The matrices below show the numbers of each type of T-shirt in each store and the cost for each type of T-shirt. The value of Daisun's T-shirt inventory is computed using the costs listed. What is the total value of the T-shirt inventory for Daisun's 2 stores?

$$\begin{matrix} & \begin{matrix} A & B & C \end{matrix} \\ \begin{matrix} X \\ Y \end{matrix} & \begin{bmatrix} 100 & 200 & 150 \\ 120 & 50 & 100 \end{bmatrix} \end{matrix} \quad \begin{matrix} \text{Cost} \\ A \\ B \\ C \end{matrix} \begin{bmatrix} \$ 5 \\ \$10 \\ \$15 \end{bmatrix}$$

- A. \$2,200
  - B. \$2,220
  - C. \$4,965
  - D. \$5,450
  - E. \$7,350
12. Given the triangle shown below with exterior angles that measure  $x^\circ$ ,  $y^\circ$ , and  $z^\circ$  as shown, what is the sum of  $x$ ,  $y$ , and  $z$  ?



- F. 180
- G. 231
- H. 309
- J. 360
- K. Cannot be determined from the given information

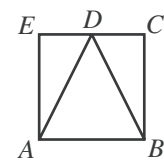
Use the following information to answer questions 13–15.

A poll of 200 registered voters was taken before the election for mayor of Springdale. All 200 voters indicated which 1 of the 4 candidates they would vote for. The results of the poll are given in the table below.

Candidate	Number of voters
Blackcloud	50
Lue	80
Gomez	40
Whitney	30

13. What percent of the voters polled chose Whitney in the poll?
- A. 15%
  - B. 20%
  - C. 25%
  - D. 30%
  - E. 40%
14. If the poll is indicative of how the 10,000 registered voters of Springdale will actually vote in the election, which of the following is the best estimate of the number of votes Lue will receive in the election?
- F. 1,500
  - G. 2,500
  - H. 4,000
  - J. 5,000
  - K. 8,000
15. If the information in the table were converted into a circle graph (pie chart), then the central angle of the sector for Gomez would measure how many degrees?
- A.  $54^\circ$
  - B.  $72^\circ$
  - C.  $90^\circ$
  - D.  $108^\circ$
  - E.  $144^\circ$

16. In square  $ABCE$  shown below,  $D$  is the midpoint of  $\overline{CE}$ . Which of the following is the ratio of the area of  $\triangle ADE$  to the area of  $\triangle ADB$  ?



- F. 1:1
- G. 1:2
- H. 1:3
- J. 1:4
- K. 1:8



17. Which of the following is the slope of a line parallel to the line  $y = \frac{2}{3}x - 4$  in the standard  $(x,y)$  coordinate plane?

- A.  $-4$
- B.  $-\frac{3}{2}$
- C.  $2$
- D.  $\frac{3}{2}$
- E.  $\frac{2}{3}$

18. Janelle cut a board 30 feet long into 2 pieces. The ratio of the lengths of the 2 pieces is 2:3. What is the length, to the nearest foot, of the shorter piece?

- F. 5
- G. 6
- H. 12
- J. 15
- K. 18

19. What is the smallest integer greater than  $\sqrt{58}$ ?

- A. 4
- B. 7
- C. 8
- D. 10
- E. 30

20. Sergio plans to paint the 4 walls of his room with 1 coat of paint. The walls are rectangular, and, according to his measurements, each wall is 10 feet by 15 feet. He will not need to paint the single 3-foot-by-5-foot rectangular window in his room and the  $3\frac{1}{2}$ -foot-by-7-foot rectangular door. Sergio knows that each gallon of paint covers between 300 and 350 square feet. If only 1-gallon cans of paint are available, which of the following is the minimum number of cans of paint Sergio needs to buy to paint his walls?

- F. 1
- G. 2
- H. 3
- J. 4
- K. 5

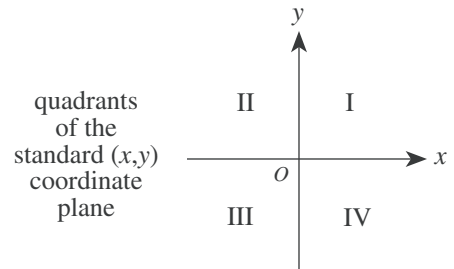
21. What values of  $x$  are solutions for  $x^2 + 2x = 8$ ?

- A.  $-4$  and  $2$
- B.  $-2$  and  $0$
- C.  $-2$  and  $4$
- D.  $0$  and  $2$
- E.  $6$  and  $8$

22. For all  $a > 1$ , the expression  $\frac{3a^4}{3a^6}$  equals:

- F.  $\frac{1}{2}$
- G.  $-a^2$
- H.  $a^2$
- J.  $-\frac{1}{a^2}$
- K.  $\frac{1}{a^2}$

23. If point  $M$  has a nonzero  $x$ -coordinate and a nonzero  $y$ -coordinate and the coordinates have opposite signs, then point  $M$  *must* be located in which of the 4 quadrants labeled below?



- A. I only
- B. III only
- C. I or III only
- D. I or IV only
- E. II or IV only

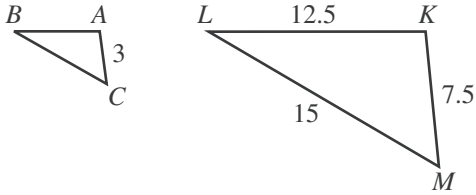
24. The fixed costs of manufacturing basketballs in a factory are \$1,400.00 per day. The variable costs are \$5.25 per basketball. Which of the following expressions can be used to model the cost of manufacturing  $b$  basketballs in 1 day?

- F.  $\$1,405.25b$
- G.  $\$5.25b - \$1,400.00$
- H.  $\$1,400.00b + \$5.25$
- J.  $\$1,400.00 - \$5.25b$
- K.  $\$1,400.00 + \$5.25b$



25. In the figure below, where  $\triangle ABC \sim \triangle KLM$ , lengths given are in centimeters. What is the perimeter, in centimeters, of  $\triangle ABC$ ?

(Note: The symbol  $\sim$  means "is similar to.")



- A. 12  
 B. 14  
 C.  $21\frac{1}{2}$   
 D. 35  
 E.  $71\frac{3}{4}$
26. If  $\frac{3\sqrt{7}}{a\sqrt{7}} = \frac{3\sqrt{7}}{7}$  is true, then  $a = ?$

- F. 1  
 G.  $\sqrt{7}$   
 H. 7  
 J. 21  
 K. 49

27. A hot-air balloon 70 meters above the ground is falling at a constant rate of 6 meters per second while another hot-air balloon 10 meters above the ground is rising at a constant rate of 15 meters per second. To the nearest tenth of a second, after how many seconds will the 2 balloons be the same height above the ground?

- A. 8.9  
 B. 6.7  
 C. 2.9  
 D. 0.4  
 E. 0.2

28. A hiking group will go from a certain town to a certain village by van on 1 of 4 roads, from the village to a waterfall by riding bicycles on 1 of 2 bicycle paths, and then from the waterfall to their campsite by hiking on 1 of 6 trails. How many routes are possible for the hiking group to go from the town to the village to the waterfall to their campsite?

- F. 6  
 G. 12  
 H. 24  
 J. 48  
 K. 220

29. Cube A has an edge length of 2 inches. Cube B has an edge length double that of Cube A. What is the volume, in cubic inches, of Cube B?

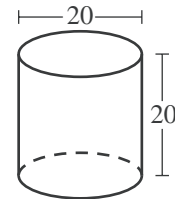
- A. 4  
 B. 8  
 C. 16  
 D. 32  
 E. 64

30. A formula used to compute the current value of a savings account is  $A = P(1 + r)^n$ , where  $A$  is the current value;  $P$  is the amount deposited;  $r$  is the rate of interest for 1 compounding period, expressed as a decimal; and  $n$  is the number of compounding periods. Which of the following is closest to the value of a savings account after 5 years if \$10,000 is deposited at 4% annual interest compounded yearly?

- F. \$10,400  
 G. \$12,167  
 H. \$42,000  
 J. \$52,000  
 K. \$53,782

31. A right circular cylinder is shown in the figure below, with dimensions given in centimeters. What is the total surface area of this cylinder, in square centimeters?

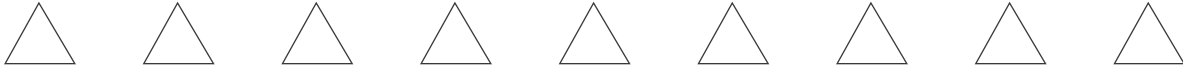
(Note: The total surface area of a cylinder is given by  $2\pi r^2 + 2\pi rh$  where  $r$  is the radius and  $h$  is the height.)



- A.  $300\pi$   
 B.  $400\pi$   
 C.  $500\pi$   
 D.  $600\pi$   
 E.  $1,600\pi$

32. Given  $f(x) = 4x + 1$  and  $g(x) = x^2 - 2$ , which of the following is an expression for  $f(g(x))$ ?

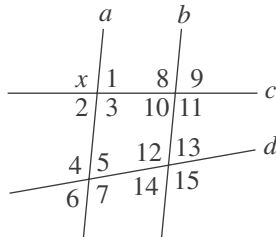
- F.  $-x^2 + 4x + 1$   
 G.  $x^2 + 4x - 1$   
 H.  $4x^2 - 7$   
 J.  $4x^2 - 1$   
 K.  $16x^2 + 8x - 1$



33. The table below shows the total number of goals scored in each of 43 soccer matches in a regional tournament. What is the average number of goals scored per match, to the nearest 0.1 goal?

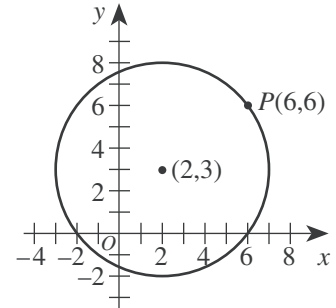
Total number of goals in a match	Number of matches with this total
0	4
1	10
2	5
3	9
4	7
5	5
6	1
7	2

- A. 1.0  
 B. 2.8  
 C. 3.0  
 D. 6.1  
 E. 17.1
34. Lines  $a$ ,  $b$ ,  $c$ , and  $d$  are shown below and  $a \parallel b$ . Which of the following is the set of all angles that *must* be supplementary to  $\angle x$ ?

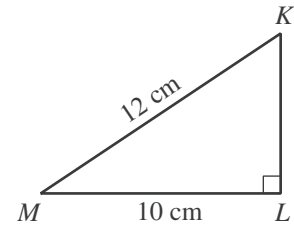


- F.  $\{1, 2\}$   
 G.  $\{1, 2, 5, 6\}$   
 H.  $\{1, 2, 9, 10\}$   
 J.  $\{1, 2, 5, 6, 9, 10\}$   
 K.  $\{1, 2, 5, 6, 9, 10, 13, 14\}$
35.  $(3x^3)^3$  is equivalent to:
- A.  $x$   
 B.  $9x^6$   
 C.  $9x^9$   
 D.  $27x^6$   
 E.  $27x^9$
36. Which of the following is equivalent to the inequality  $4x - 8 > 8x + 16$ ?
- F.  $x < -6$   
 G.  $x > -6$   
 H.  $x < -2$   
 J.  $x > 2$   
 K.  $x < 6$

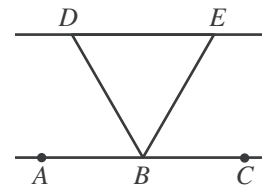
37. As shown in the standard  $(x,y)$  coordinate plane below,  $P(6,6)$  lies on the circle with center  $(2,3)$  and radius 5 coordinate units. What are the coordinates of the image of  $P$  after the circle is rotated  $90^\circ$  clockwise ( $C$ ) about the center of the circle?



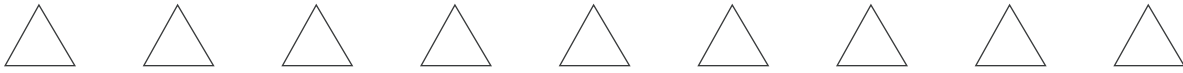
- A.  $(2, 3)$   
 B.  $(3, 2)$   
 C.  $(5, -1)$   
 D.  $(6, 0)$   
 E.  $(7, 3)$
38. For right triangle  $\triangle KLM$  below, what is  $\sin \angle M$ ?



- F.  $\frac{10}{12}$   
 G.  $\frac{12}{10}$   
 H.  $\frac{\sqrt{44}}{10}$   
 J.  $\frac{10}{\sqrt{44}}$   
 K.  $\frac{\sqrt{44}}{12}$
39. In the figure below,  $B$  lies on  $\overline{AC}$ ,  $\overline{BD}$  bisects  $\angle ABE$ , and  $\overline{BE}$  bisects  $\angle CBD$ . What is the measure of  $\angle DBE$ ?

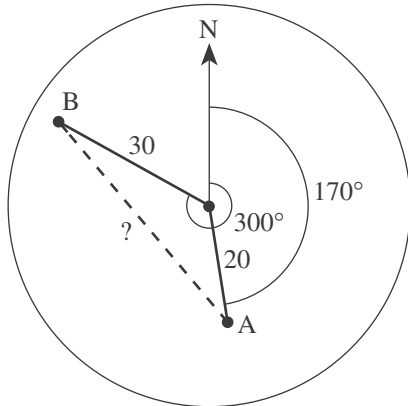


- A.  $90^\circ$   
 B.  $60^\circ$   
 C.  $45^\circ$   
 D.  $30^\circ$   
 E. Cannot be determined from the given information
40. If there are  $8 \times 10^{12}$  hydrogen molecules in a volume of  $4 \times 10^4$  cubic centimeters, what is the average number of hydrogen molecules per cubic centimeter?
- F.  $5 \times 10^{-9}$   
 G.  $2 \times 10^3$   
 H.  $2 \times 10^8$   
 J.  $32 \times 10^{16}$   
 K.  $32 \times 10^{48}$

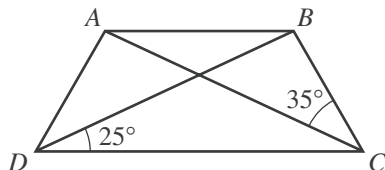


41. In the figure below, a radar screen shows 2 ships. Ship A is located at a distance of 20 nautical miles and bearing  $170^\circ$ , and Ship B is located at a distance of 30 nautical miles and bearing  $300^\circ$ . Which of the following is an expression for the straight-line distance, in nautical miles, between the 2 ships?

(Note: For  $\triangle ABC$  with side of length  $a$  opposite  $\angle A$ , side of length  $b$  opposite  $\angle B$ , and side of length  $c$  opposite  $\angle C$ , the law of cosines states  $c^2 = a^2 + b^2 - 2ab \cos \angle C$ .)

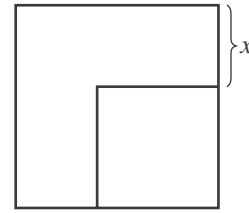


- A.  $\sqrt{20^2 + 30^2 - 2(20)(30)\cos 60^\circ}$   
 B.  $\sqrt{20^2 + 30^2 - 2(20)(30)\cos 130^\circ}$   
 C.  $\sqrt{20^2 + 30^2 - 2(20)(30)\cos 170^\circ}$   
 D.  $\sqrt{20^2 + 30^2 - 2(20)(30)\cos 300^\circ}$   
 E.  $\sqrt{20^2 + 30^2 - 2(20)(30)\cos 470^\circ}$
42. What rational number is halfway between  $\frac{1}{5}$  and  $\frac{1}{3}$ ?
- F.  $\frac{1}{2}$   
 G.  $\frac{1}{4}$   
 H.  $\frac{2}{15}$   
 J.  $\frac{4}{15}$   
 K.  $\frac{8}{15}$
43. In isosceles trapezoid  $ABCD$ ,  $\overline{AB}$  is parallel to  $\overline{DC}$ ,  $\angle BDC$  measures  $25^\circ$ , and  $\angle BCA$  measures  $35^\circ$ . What is the measure of  $\angle DBC$ ?



- A.  $85^\circ$   
 B.  $95^\circ$   
 C.  $105^\circ$   
 D.  $115^\circ$   
 E.  $125^\circ$

44. In the figure below, the area of the larger square is 50 square centimeters and the area of the smaller square is 18 square centimeters. What is  $x$ , in centimeters?



- F. 2  
 G.  $2\sqrt{2}$   
 H.  $4\sqrt{2}$   
 J. 16  
 K. 32
45. Which of the following is a rational number?

- A.  $\sqrt{2}$   
 B.  $\sqrt{\pi}$   
 C.  $\sqrt{7}$   
 D.  $\sqrt{\frac{5}{25}}$   
 E.  $\sqrt{\frac{64}{49}}$

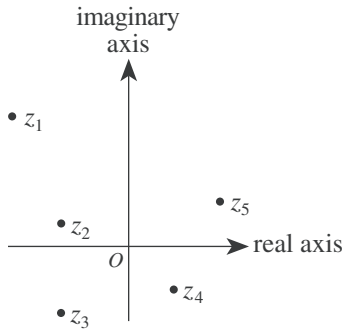
46. If  $a < b$ , then  $|a - b|$  is equivalent to which of the following?
- F.  $a + b$   
 G.  $-(a + b)$   
 H.  $\sqrt{a - b}$   
 J.  $a - b$   
 K.  $-(a - b)$

47. Tom has taken 5 of the 8 equally weighted tests in his U.S. History class this semester, and he has an average score of exactly 78.0 points. How many points does he need to earn on the 6th test to bring his average score up to exactly 80.0 points?

- A. 90  
 B. 88  
 C. 82  
 D. 80  
 E. 79



48. In the complex plane, the horizontal axis is called the *real axis* and the vertical axis is called the *imaginary axis*. The complex number  $a + bi$  graphed in the complex plane is comparable to the point  $(a,b)$  graphed in the standard  $(x,y)$  coordinate plane. The *modulus* of the complex number  $a + bi$  is given by  $\sqrt{a^2 + b^2}$ . Which of the complex numbers  $z_1$ ,  $z_2$ ,  $z_3$ ,  $z_4$ , and  $z_5$  below has the greatest modulus?

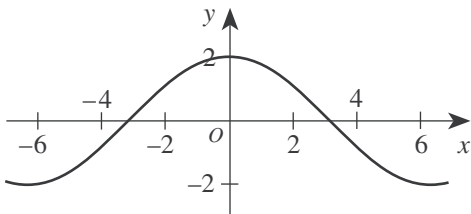


- F.  $z_1$   
G.  $z_2$   
H.  $z_3$   
J.  $z_4$   
K.  $z_5$

49. In the real numbers, what is the solution of the equation  $8^{2x+1} = 4^{1-x}$ ?

- A.  $-\frac{1}{3}$   
B.  $-\frac{1}{4}$   
C.  $-\frac{1}{8}$   
D. 0  
E.  $\frac{1}{7}$

50. The graph of the trigonometric function  $y = 2 \cos\left(\frac{1}{2}x\right)$  is shown below.



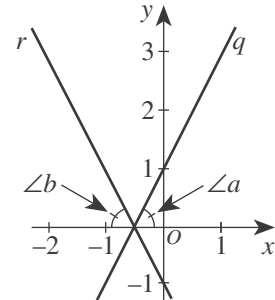
The function is:

- F. even (that is,  $f(x) = f(-x)$  for all  $x$ ).  
G. odd (that is,  $f(-x) = -f(x)$  for all  $x$ ).  
H. neither even nor odd.  
J. the inverse of a cotangent function.  
K. undefined at  $x = \pi$ .

51. An integer from 100 through 999, inclusive, is to be chosen at random. What is the probability that the number chosen will have 0 as at least 1 digit?

- A.  $\frac{19}{900}$   
B.  $\frac{81}{900}$   
C.  $\frac{90}{900}$   
D.  $\frac{171}{900}$   
E.  $\frac{271}{1,000}$

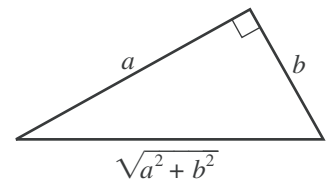
52. In the figure below, line  $q$  in the standard  $(x,y)$  coordinate plane has equation  $-2x + y = 1$  and intersects line  $r$ , which is distinct from line  $q$ , at a point on the  $x$ -axis. The angles,  $\angle a$  and  $\angle b$ , formed by these lines and the  $x$ -axis are congruent. What is the slope of line  $r$ ?



- F. -2  
G.  $-\frac{1}{2}$   
H.  $\frac{1}{2}$   
J. 2  
K. Cannot be determined from the given information

53. In the right triangle below,  $0 < b < a$ . One of the angle measures in the triangle is  $\tan^{-1}\left(\frac{a}{b}\right)$ . What is  $\cos\left[\tan^{-1}\left(\frac{a}{b}\right)\right]$ ?

- A.  $\frac{a}{b}$   
B.  $\frac{b}{a}$   
C.  $\frac{a}{\sqrt{a^2 + b^2}}$   
D.  $\frac{b}{\sqrt{a^2 + b^2}}$   
E.  $\frac{\sqrt{a^2 + b^2}}{a}$

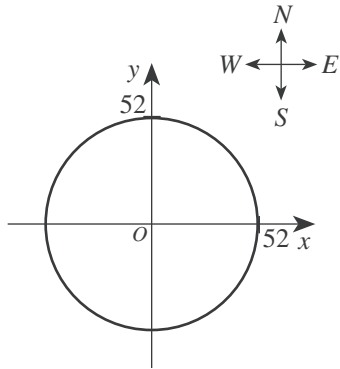






Use the following information to answer questions 54–56.

The radio signal from the transmitter site of radio station WGGW can be received only within a radius of 52 miles in all directions from the transmitter site. A map of the region of coverage of the radio signal is shown below in the standard  $(x,y)$  coordinate plane, with the transmitter site at the origin and 1 coordinate unit representing 1 mile.



54. Which of the following is closest to the area, in square miles, of the region of coverage of the radio signal?

F. 2,120  
G. 2,700  
H. 4,250  
J. 8,500  
K. 16,990

55. Which of the following is an equation of the circle shown on the map?

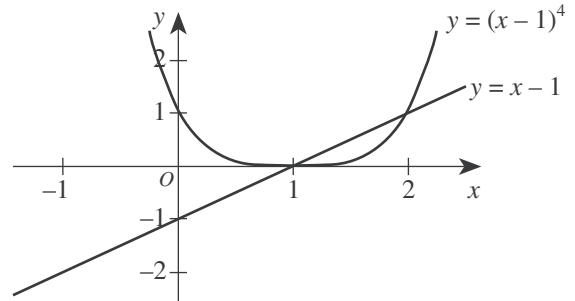
A.  $x + y = 52$   
B.  $(x + y)^2 = 52$   
C.  $(x + y)^2 = 52^2$   
D.  $x^2 + y^2 = 52$   
E.  $x^2 + y^2 = 52^2$

56. The transmitter site of radio station WGGW and the transmitter site of another radio station, WGWB, are on the same highway 100 miles apart. The radio signal from the transmitter site of WGWB can be received only within a radius of 60 miles in all directions from the WGWB transmitter site. For how many miles along the highway can the radio signals of *both* stations be received?

(Note: Assume the highway is straight.)

F. 8  
G. 12  
H. 40  
J. 44  
K. 48

57. The graphs of the equations  $y = x - 1$  and  $y = (x - 1)^4$  are shown in the standard  $(x,y)$  coordinate plane below. What real values of  $x$ , if any, satisfy the inequality  $(x - 1)^4 < (x - 1)$ ?

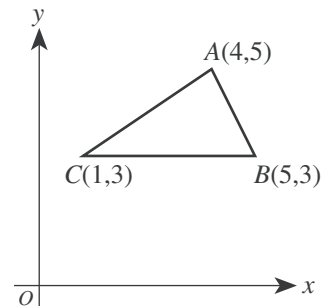


A. No real values  
B.  $x < 0$  and  $x > 1$   
C.  $x < 1$  and  $x > 2$   
D.  $0 < x < 1$   
E.  $1 < x < 2$

58. For every positive 2-digit number,  $x$ , with tens digit  $t$  and units digit  $u$ , let  $y$  be the 2-digit number formed by reversing the digits of  $x$ . Which of the following expressions is equivalent to  $x - y$ ?

F.  $9(t - u)$   
G.  $9(u - t)$   
H.  $9t - u$   
J.  $9u - t$   
K. 0

59. In the figure below, the vertices of  $\triangle ABC$  have  $(x,y)$  coordinates  $(4,5)$ ,  $(5,3)$ , and  $(1,3)$ , respectively. What is the area of  $\triangle ABC$ ?



A. 4  
B.  $4\sqrt{2}$   
C.  $4\sqrt{3}$   
D. 8  
E.  $8\sqrt{2}$

60. The sum of an infinite geometric series with first term  $a$  and common ratio  $r < 1$  is given by  $\frac{a}{1-r}$ . The sum of a given infinite geometric series is 200, and the common ratio is 0.15. What is the second term of this series?

F. 25.5  
G. 30  
H. 169.85  
J. 170  
K. 199.85

END OF TEST 2

STOP! DO NOT TURN THE PAGE UNTIL TOLD TO DO SO.

DO NOT RETURN TO THE PREVIOUS TEST.

**Test 2: Mathematics—Scoring Key**

		Subscore Area*					Subscore Area*		
	Key	EA	AG	GT		Key	EA	AG	GT
1.	D	_____			31.	D			_____
2.	G	_____			32.	H		_____	
3.	C	_____			33.	B	_____		
4.	J	_____			34.	H			_____
5.	C			_____	35.	E		_____	
6.	J	_____			36.	F		_____	
7.	C	_____			37.	C		_____	
8.	H	_____			38.	K			_____
9.	D		_____		39.	B			_____
10.	F		_____		40.	H	_____		
11.	E		_____		41.	B			_____
12.	J			_____	42.	J	_____		
13.	A	_____			43.	B			_____
14.	H	_____			44.	G			_____
15.	B			_____	45.	E	_____		
16.	G			_____	46.	K	_____		
17.	E		_____		47.	A	_____		
18.	H	_____			48.	F		_____	
19.	C	_____			49.	C		_____	
20.	G			_____	50.	F			_____
21.	A	_____			51.	D	_____		
22.	K		_____		52.	F		_____	
23.	E		_____		53.	D			_____
24.	K	_____			54.	J			_____
25.	B			_____	55.	E		_____	
26.	G		_____		56.	G			_____
27.	C	_____			57.	E		_____	
28.	J	_____			58.	F	_____		
29.	E			_____	59.	A		_____	
30.	G	_____			60.	F		_____	

Number Correct (Raw Score) for:	
Pre-Alg./Elem. Alg. (EA) Subscore Area	_____ (24)
Inter. Alg./Coord. Geo. (AG) Subscore Area	_____ (18)
Plane Geo./Trig. (GT) Subscore Area	_____ (18)
Total Number Correct for Math Test (EA + AG + GT)	_____ (60)

\* EA = Pre-Algebra/Elementary Algebra  
 AG = Intermediate Algebra/Coordinate Geometry  
 GT = Plane Geometry/Trigonometry

**TABLE 1****Explanation of Procedures Used to Obtain Scale Scores from Raw Scores**

On each of the four multiple-choice tests on which you marked any responses, the total number of correct responses yields a raw score. Use the table below to convert your raw scores to scale scores. For each test, locate and circle your raw score or the range of raw scores that includes it in the table below. Then, read across to either outside column of the table and circle the scale score that corresponds to that raw score. As you determine your scale scores, enter them in the blanks provided on the right. The highest possible scale score for each test is 36. The lowest possible scale score for any test on which you marked any responses is 1.

Next, compute the Composite score by averaging the four scale scores. To do this, add your four scale scores and divide the sum by 4. If the resulting number ends in a fraction, round it off to the nearest whole number. (Round down any fraction less than one-half; round up any fraction that is one-half or more.) Enter this number in the blank. This is your Composite score. The highest possible Composite score is 36. The lowest possible Composite score is 1.

<b>ACT Test 64E</b>	<b>Your Scale Score</b>
English	_____
Mathematics	_____
Reading	_____
Science	_____
<b>Sum of scores</b>	_____
<b>Composite score (sum ÷ 4)</b>	_____

NOTE: If you left a test completely blank and marked no items, do not list a scale score for that test. If any test was completely blank, do not calculate a Composite score.

<b>Scale Score</b>	<b>Raw Scores</b>				<b>Scale Score</b>
	<b>Test 1 English</b>	<b>Test 2 Mathematics</b>	<b>Test 3 Reading</b>	<b>Test 4 Science</b>	
36	75	60	40	40	36
35	73-74	59	39	39	35
34	71-72	58	38	—	34
33	70	56-57	37	38	33
32	69	55	36	37	32
31	67-68	54	35	—	31
30	66	52-53	34	36	30
29	65	50-51	32-33	35	29
28	63-64	48-49	31	33-34	28
27	62	45-47	30	32	27
26	60-61	42-44	29	30-31	26
25	58-59	40-41	27-28	28-29	25
24	56-57	37-39	26	26-27	24
23	54-55	35-36	24-25	25	23
22	52-53	33-34	23	23-24	22
21	49-51	31-32	22	21-22	21
20	46-48	29-30	20-21	19-20	20
19	43-45	26-28	19	18	19
18	41-42	24-25	18	16-17	18
17	39-40	21-23	16-17	15	17
16	36-38	17-20	15	14	16
15	33-35	14-16	14	13	15
14	30-32	11-13	12-13	12	14
13	28-29	9-10	11	11	13
12	26-27	7-8	9-10	10	12
11	24-25	6	8	9	11
10	22-23	5	6-7	7-8	10
9	20-21	4	—	6	9
8	17-19	3	5	5	8
7	14-16	—	4	4	7
6	11-13	2	3	3	6
5	8-10	—	—	—	5
4	6-7	1	2	2	4
3	4-5	—	—	1	3
2	3	—	1	—	2
1	0-2	0	0	0	1

# TABLE 2

ACT Test 64E Your Scale Subscore

## Explanation of Procedures Used to Obtain Scale Subscores from Raw Scores

For each of the seven subscore areas, the total number of correct responses yields a raw score. Use the table below to convert your raw scores to scale subscores. For each of the seven subscore areas, locate and circle either the raw score or the range of raw scores that includes it in the table below. Then, read across to either outside column of the table and circle the scale subscore that corresponds to that raw score. As you determine your scale subscores, enter them in the blanks provided on the right. The highest possible scale subscore is 18. The lowest possible scale subscore is 1.

If you left a test completely blank and marked no responses, do not list any scale subscores for that test.

<b>English</b>	_____
Usage/Mechanics	_____
Rhetorical Skills	_____
<b>Mathematics</b>	_____
Pre-Algebra/Elementary Algebra	_____
Intermed. Algebra/Coord. Geometry	_____
Plane Geometry/Trigonometry	_____
<b>Reading</b>	_____
Social Studies/Sciences	_____
Arts/Literature	_____

Scale Subscore	Raw Scores										Scale Subscore	
	Test 1 English			Test 2 Mathematics			Test 3 Reading					
	Usage/Mechanics	Rhetorical Skills	Pre-Algebra/Elem. Algebra	Inter. Algebra/Coord. Geometry	Plane Geometry/Trigonometry	Social Studies/Sciences	Arts/Literature	Social Studies/Sciences	Arts/Literature	Social Studies/Sciences		
18	38-40	35	23-24	18	18	18	20	20	20	18	18	18
17	37	33-34	22	17	—	—	18-19	18-19	19	17	17	17
16	35-36	32	21	16	17	17	17	17	18	16	16	16
15	34	30-31	20	14-15	16	15-16	15-16	15-16	17	15	15	15
14	33	29	18-19	13	14-15	14	14	14	16	14	14	14
13	31-32	27-28	17	11-12	12-13	13	13	13	15	13	13	13
12	29-30	25-26	16	10	10-11	10	11-12	11-12	13-14	12	12	12
11	27-28	23-24	14-15	8-9	9	10	10	10	12	11	11	11
10	25-26	20-22	13	7	7-8	7	9	9	11	10	10	10
9	23-24	18-19	11-12	5-6	6	6	6-7	6-7	10	9	9	9
8	20-22	15-17	9-10	4	5	5	5	5	9	8	8	8
7	18-19	13-14	7-8	—	4	4	4	4	8	7	7	7
6	16-17	11-12	5-6	3	3	3	—	—	6-7	6	6	6
5	13-15	9-10	4	2	2	2	—	—	4-5	5	5	5
4	11-12	7-8	3	—	—	—	3	3	3	4	4	4
3	9-10	5-6	2	1	1	1	2	2	2	3	3	3
2	5-8	3-4	1	—	—	—	1	1	1	2	2	2
1	0-4	0-2	0	0	0	0	0	0	0	1	1	1

# TABLES 3A and 3B

## Norms Tables

Use the norms tables below (3A and 3B) to determine your estimated percent at or below for each of your multiple-choice scale scores (3A), and for your Writing scores (3B), if applicable.

In the far left column of the multiple-choice norms table (3A), circle your scale score for the English Test (from page 63). Then read across to the percent at or below column for that test; circle or put a check mark beside the corresponding percent at or below. Use the same procedure for each test and subscore area. Use the far right column of scale scores in Table 3A, for your Science Test and Composite scores. Follow the same procedure on the Writing Test norms to get your estimated percent at or below for your Writing subscore and Combined English/Writing score.

As you mark your percents at or below, enter them in the blanks provided at the right. You may also find it helpful to compare your performance with the national mean (average) score for each of the tests, subscore areas, and the Composite as shown at the bottom of the norms tables.

**Your Estimated Percent At or Below on Practice Test**

**English**

Usage/Mechanics \_\_\_\_\_

Rhetorical Skills \_\_\_\_\_

**Mathematics**

Pre-Algebra/Elem. Alg. \_\_\_\_\_

Alg./Coord. Geometry \_\_\_\_\_

Plane Geometry/Trig. \_\_\_\_\_

**Reading**

Soc. Studies/Sciences \_\_\_\_\_

Arts/Literature \_\_\_\_\_

**Science**

**Composite**

**Combined English/Writing**

**Writing**

### 3A

**National Distributions of Cumulative Percents for ACT Test Scores  
ACT-Tested High School Graduates from 2007, 2008, and 2009**

Score	ENGLISH		MATHEMATICS			READING			SCIENCE		COMPOSITE	Score	
	Usage/Mechanics	Rhetorical Skills	Pre-Algebra/Elem. Alg.	Alg./Coord. Geometry	Plane Geometry/Trig.	Soc. Studies/Sciences	Arts/Literature						
36	99		99			99		99	99	99	36		
35	99		99			99		99	99	99	35		
34	99		99			99		99	99	99	34		
33	97		98			97		99	99	99	33		
32	96		97			95		98	99	99	32		
31	95		96			93		97	97	97	31		
30	93		95			91		97	96	96	30		
29	91		93			88		95	94	94	29		
28	89		91			85		94	91	91	28		
27	86		88			81		92	88	88	27		
26	83		84			78		89	84	84	26		
25	79		79			74		85	80	80	25		
24	74		74			70		78	75	75	24		
23	69		68			65		72	69	69	23		
22	64		62			59		65	62	62	22		
21	57		57			54		56	55	55	21		
20	50		52			47		48	48	48	20		
19	42		47			41		38	40	40	19		
18	36	99	99	40	99	99	99	34	99	99	33	18	
17	32	97	99	33	96	99	99	30	98	97	22	26	17
16	27	93	97	24	92	98	98	24	93	92	17	20	16
15	22	89	93	14	87	96	95	19	88	85	13	14	15
14	16	84	86	06	81	92	90	14	82	77	10	09	14
13	12	78	80	02	74	84	83	09	76	70	07	05	13
12	10	72	71	01	66	75	73	06	69	64	05	02	12
11	07	64	60	01	57	66	63	03	59	55	03	01	11
10	05	55	48	01	48	53	52	01	50	46	01	01	10
09	03	44	36	01	39	36	37	01	39	38	01	01	09
08	02	34	26	01	31	23	25	01	28	29	01	01	08
07	01	26	16	01	19	13	15	01	17	21	01	01	07
06	01	18	10	01	08	08	09	01	10	15	01	01	06
05	01	11	06	01	03	05	06	01	05	09	01	01	05
04	01	06	03	01	01	02	03	01	03	03	01	01	04
03	01	03	01	01	01	01	02	01	01	01	01	01	03
02	01	01	01	01	01	01	01	01	01	01	01	01	02
01	01	01	01	01	01	01	01	01	01	01	01	01	01
<b>Mean</b>	<b>20.6</b>	<b>10.3</b>	<b>10.7</b>	<b>21.0</b>	<b>11.0</b>	<b>10.5</b>	<b>10.5</b>	<b>21.4</b>	<b>10.8</b>	<b>11.0</b>	<b>20.9</b>	<b>21.1</b>	
<b>S.D.</b>	<b>6.1</b>	<b>3.8</b>	<b>3.2</b>	<b>5.2</b>	<b>3.5</b>	<b>2.9</b>	<b>3.1</b>	<b>6.1</b>	<b>3.5</b>	<b>3.8</b>	<b>4.9</b>	<b>5.0</b>	

Note: These norms are the source of national and state norms, for multiple-choice tests, printed on ACT score reports during the 2009–2010 testing year. Sample size: 4,188,909.

### 3B

**National Distributions of Cumulative Percents  
for ACT Writing Test Scores  
ACT-Tested High School Graduates  
from 2007, 2008, and 2009**

Score	Combined English/Writing	Writing
36	99	
35	99	
34	99	
33	99	
32	99	
31	97	
30	95	
29	93	
28	90	
27	87	
26	83	
25	78	
24	73	
23	67	
22	59	
21	53	
20	44	
19	38	
18	31	
17	26	
16	21	
15	16	
14	12	
13	9	
12	6	99
11	4	99
10	3	98
9	2	91
8	1	81
7	1	47
6	1	33
5	1	10
4	1	6
3	1	2
2	1	1
1	1	
<b>Mean</b>	<b>21.1</b>	<b>7.3</b>
<b>S.D.</b>	<b>5.5</b>	<b>1.6</b>

Note: These norms are the source of the Writing Test norms printed on the ACT score reports of students who take the optional Writing Test during 2009–2010. Sample size: 2,116,524.