Practice Test 2

1 hour — 50 Questions

Directions

For each question, choose the BEST answer from the choices given. If the precise answer is not among the choices, choose the one that best approximates the answer.

Notes

(1) To answer some of these questions, you will need a calculator. You must use at least a scientific calculator, but programmable and graphing calculators are also allowed.

(2) All angle measures on this test are in degrees, so your calculator should be set to degree mode.

(3) Figures in this test are drawn as accurately as possible UNLESS it is stated in a specific question that the figure is not drawn to scale. All figures are assumed to lie in a plane unless otherwise specified.

(4) 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, unless otherwise indicated.

Reference Information: Use the following formulas as needed.

Right circular cone: If r = radius and h = height, then

$$\text{Volume} = \frac{1}{3}\pi r^2 h;$$

and if c = circumference of the base and ℓ = slant height, then Lateral $\text{Area} = \frac{1}{2}c\ell.$

Sphere: If r = radius, then

$$\text{Volume} = \frac{4}{3}\pi r^3$$

and Surface Area = $4\pi r^2$.

Pyramid: If B = area of the base and h = height, then

$$\text{Volume} = \frac{1}{3}Bh.$$

1. If $a + b = 10$ and both a and b are positive integers, what is the largest possible value for a?

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

2. If $2x + y = 2y - x$, then $y =$

   (A) $3x$
   (B) $4x$
   (C) $2x + 2$
   (D) $3x + 1$
   (E) $4x + 1$

3. If a certain car can travel 240 miles on 12 gallons of gasoline, then at the same rate, how many gallons of gasoline are needed to travel 300 miles?

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

4. If $2(1 + 2x) - 5(4 - 2x) = 14$, $x \approx$

   (A) −5.33
   (B) −0.29
   (C) 0.29
   (D) 0.67
   (E) 2.29

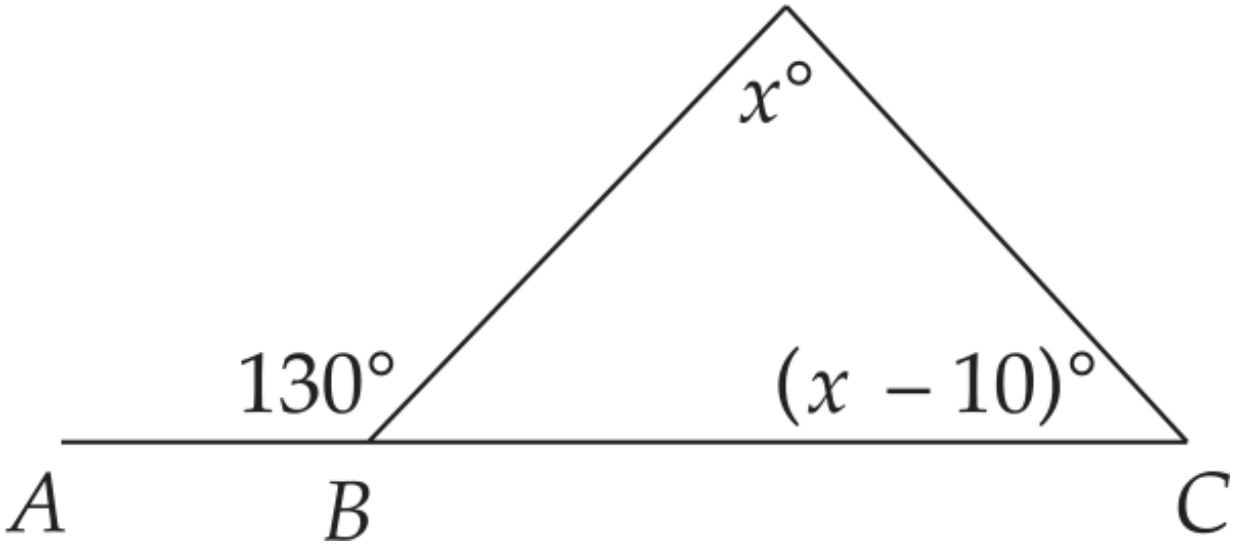
5. 

Figure 1

In Figure 1, if $\overline{ABC}$ is a straight line, x =

(A) 50
(B) 60
(C) 70
(D) 80
(E) 90

6. |–3.1| – |–4.2| + |2.3|=

(A) 1.2
(B) 3.4
(C) 6.9
(D) 7.3
(E) 9.6

7. If $x \neq 0$, then $\frac{x+1}{6x} + \frac{x+1}{2x} =$

(A) $\frac{2x+2}{3x}$

(B) $\frac{2x+2}{4x}$

(C) $\frac{2x+3}{6x}$

(D) $\frac{2x+2}{8x}$

(E) $\frac{x+2}{6x}$

8. If $8 = \frac{1}{\frac{1}{x^{-3}}}$, then $x =$

(A) −2.00
(B) −0.50
(C) 0.50
(D) 1.25
(E) 2.00

9. Which of the following is the equation of a line that makes a 45-degree angle with the x-axis and has a y-intercept of 2?

(A) $y = x + 2$
(B) $y = x - 2$
(C) $y = 45x + 2$
(D) $y = 45x - 2$
(E) $y = 2x + 45$

10. If x and y are both positive, x is even, and y is odd, which of the following must be odd?

(A) xy

(B) $x + 2y$

(C) x^y

(D) y^x

(E) $\frac{x}{y}$

11.

Figure 2

In Figure 2, if the length of $\overline{AB}$ is 2 more than 3 times the length of $\overline{BC}$, and $AC = 14$, what is the length of $\overline{BC}$?

(A) 2
(B) 3
(C) 4
(D) 7
(E) 12

12. Jean can paint a house in 10 hours, and Dan can paint the same house in 12 hours. If Jean begins the job and does $\frac{1}{3}$ of it and then Dan takes over and finishes the job, what is the total time it takes them to paint the house?

(A) 10 hours, 40 minutes
(B) 11 hours
(C) 11 hours, 20 minutes
(D) 11 hours, 40 minutes
(E) 12 hours

13. If $a = 4b$, $c = 8b^2$, and $b \neq 0$, then $\frac{c-a}{4b} =$

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

14.

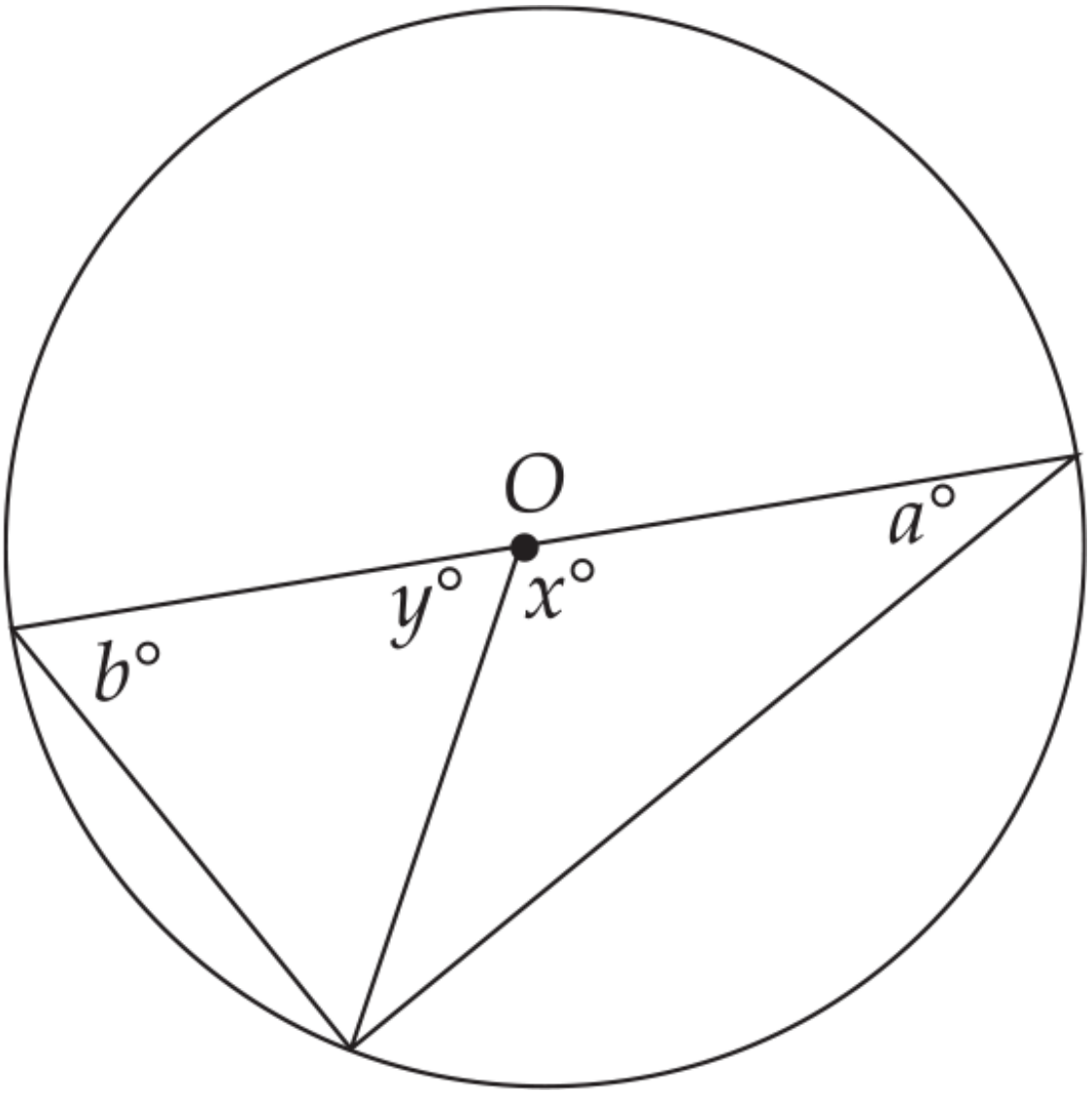


Figure 3

In Figure 3, if O is the center of the circle, and the ratio of x to y is 2 to 1, what is the ratio of a to b?

(A) 4:1
(B) 3:1
(C) 2:1
(D) 1:2
(E) 1:4

15. The cost of 2 sodas and 3 pretzels is \$4.60. If the cost of 2 pretzels is \$2.20, what is the cost of 2 sodas?

(A) \$0.60
(B) \$0.65
(C) \$1.20
(D) \$1.30
(E) \$2.40

16. If $\frac{2}{x}\left(x^2+x\right)=\frac{1}{2}$, then $x+1=$

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

(B) $\frac{1}{2}$

(C) 1

(D) $\frac{3}{2}$

(E) 2

17.

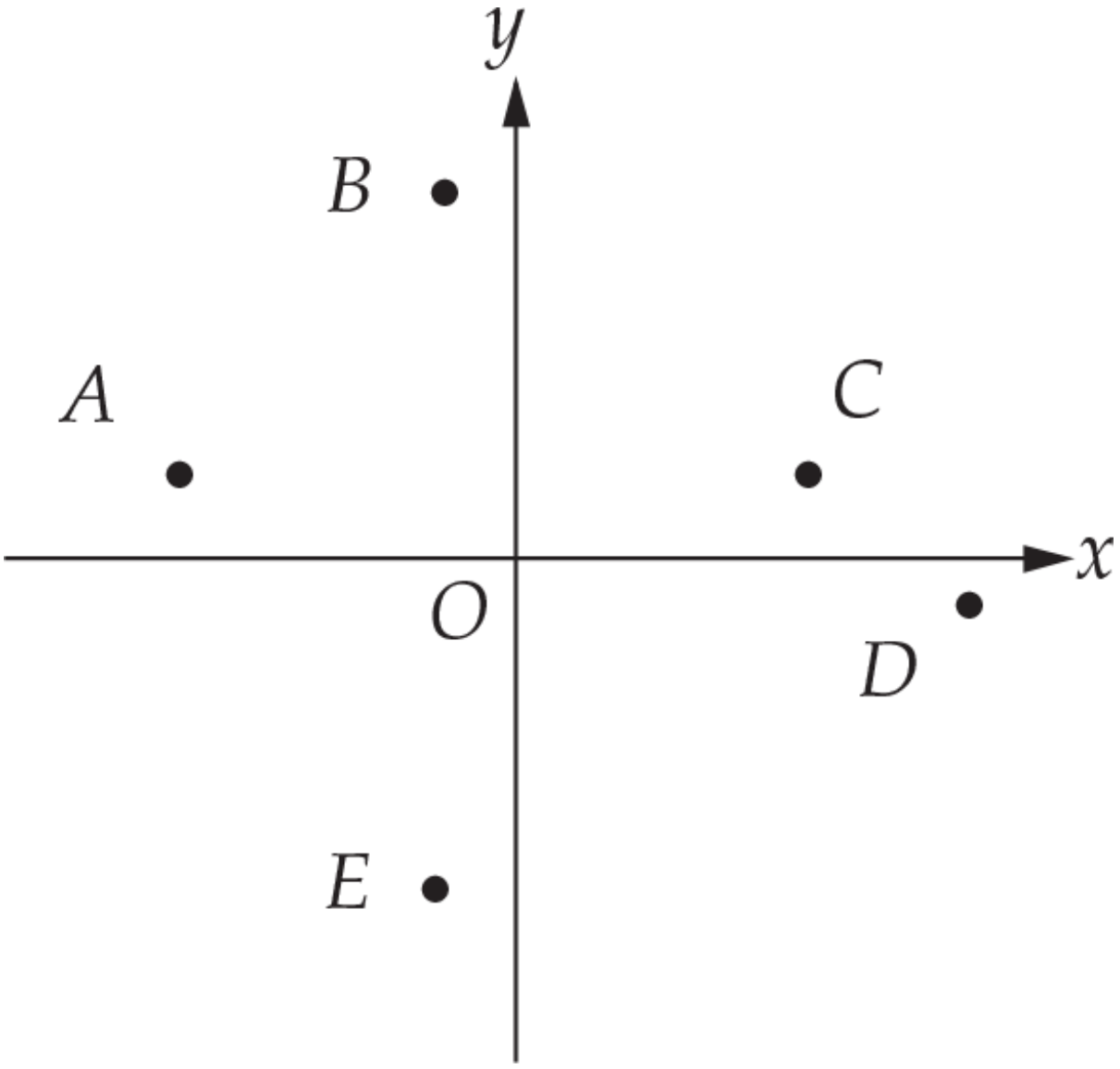


Figure 4

In Figure 4, if 5 lines are drawn by connecting the labeled points with the origin, which of the lines would have the greatest slope?

(A) $\overleftrightarrow{AO}$

(B) $\overleftrightarrow{BO}$

(C) $\overleftrightarrow{CO}$

(D) $\overleftrightarrow{DO}$

(E) $\overleftrightarrow{EO}$

18. If $f(x) = 5x - x^2$, then $f(x) = 6$ when $x =$

(A) 1 only
(B) 2 only
(C) 1 or 5
(D) 2 or 3
(E) 2 or 6

19. If 25 percent of a certain number is 36, what would 40 percent of the same number be?

(A) 13.6
(B) 22.5
(C) 42.6
(D) 52.8
(E) 57.6

20.

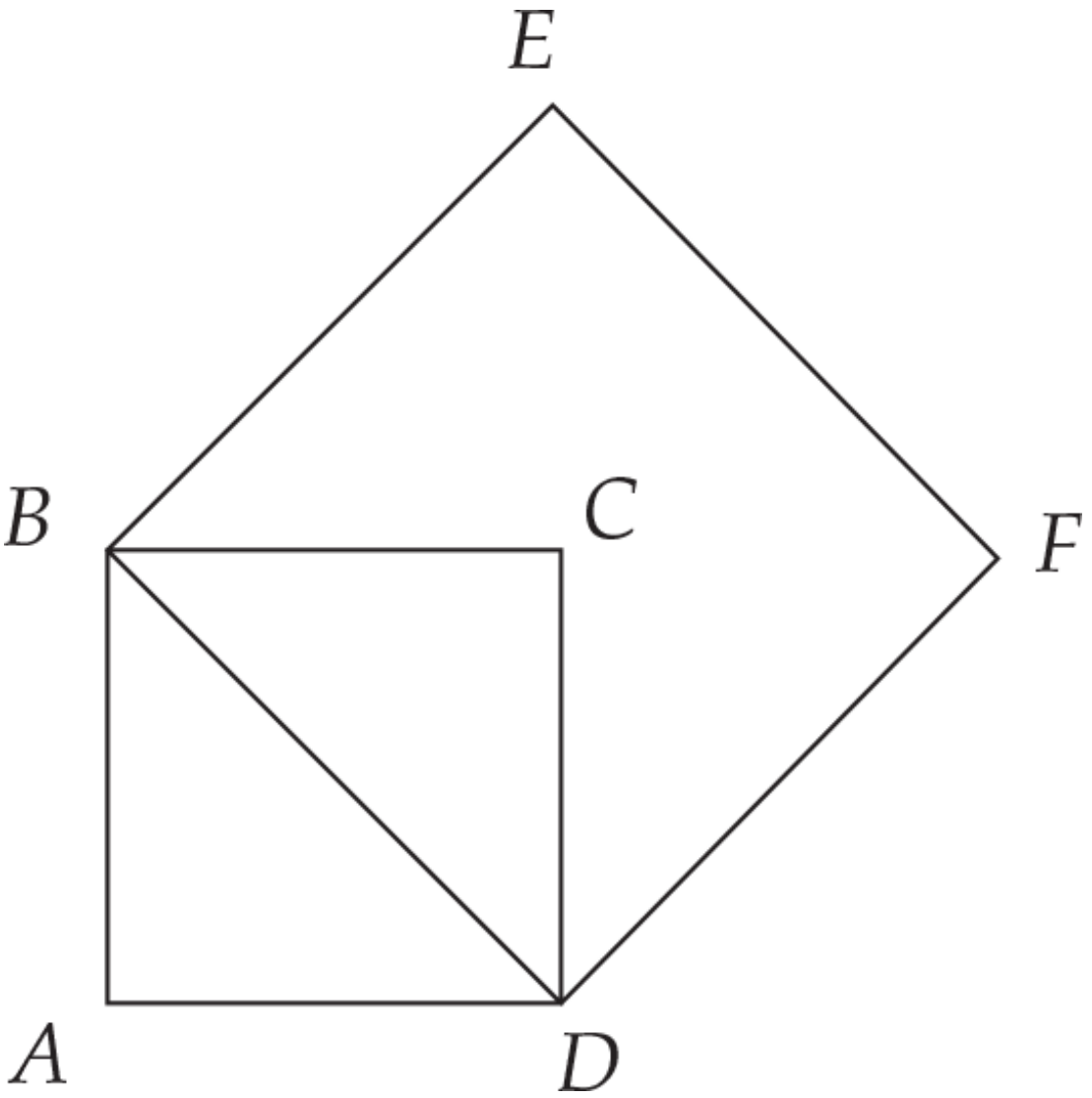


Figure 5

In Figure 5, if the area of square *ABCD* is 5, what is the area of square *BEFD*?

(A) 7.07
(B) 8.25
(C) 10.00
(D) 12.50
(E) 25.00

21. If $\sqrt{x} + 6 = x$, then $x =$

(A) 4 only
(B) 9 only
(C) 4 or 9
(D) –4 or 9
(E) There is no solution.

22. A rubber ball is dropped from a height of 10 meters. If the ball always rebounds $\frac{4}{5}$ the distance it has fallen, how far, in meters, will the ball have traveled at the moment it hits the ground for the fourth time?

(A) 4.10
(B) 5.12
(C) 29.52
(D) 43.92
(E) 49.04

23. If a varies directly as b and if $a = 4$ when $b = 5$, what is the value of a when $b = 10$?

(A) 4
(B) 5
(C) 6
(D) 8
(E) 9

24. Which of the following figures has the greatest number of lines of symmetry?

(A) Equilateral triangle
(B) Rectangle
(C) Square
(D) Rhombus
(E) Circle

25. If $f(x) = x^2 - 4x + 1$, $f(x)$ crosses the x-axis closest to which of the following points?

(A) (–0.33, 0)
(B) (0.27, 0)
(C) (1.73, 0)
(D) (3.27, 0)
(E) (4.33, 0)

26.

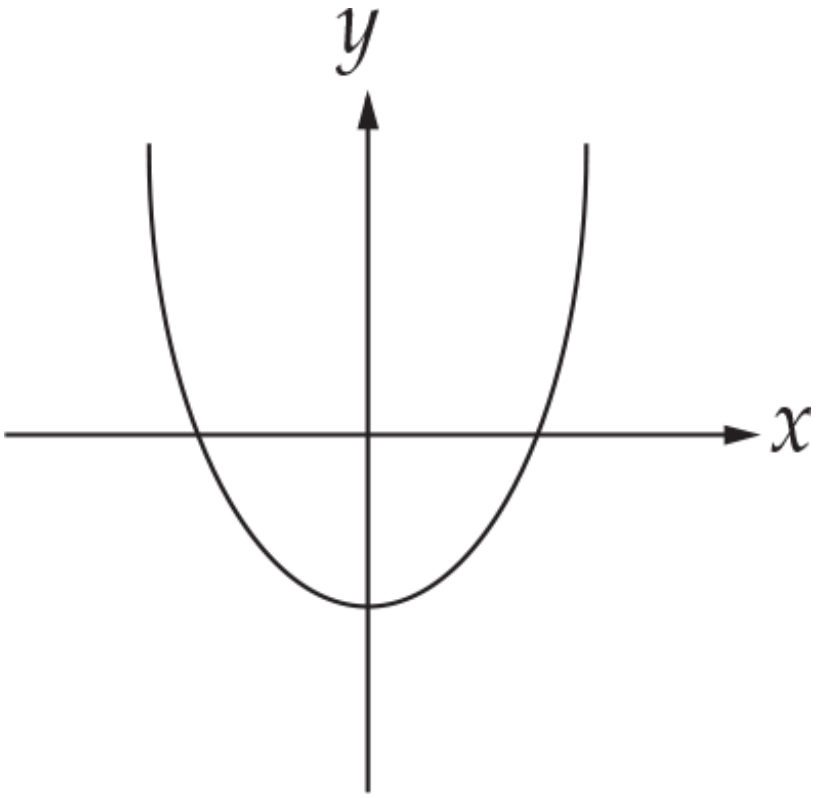
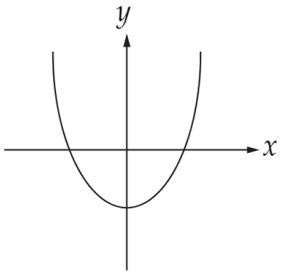


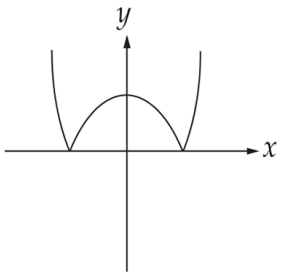
Figure 6

If the graph in Figure 6 represents $f(x)$, which of the following graphs would represent $|f(x)|$?

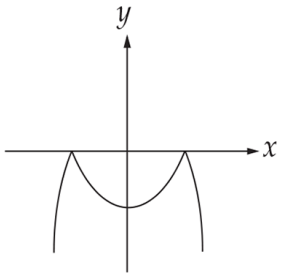
(A)



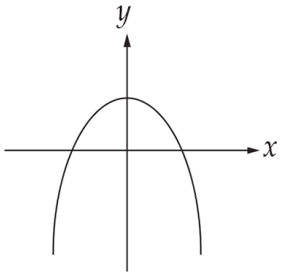
(B)



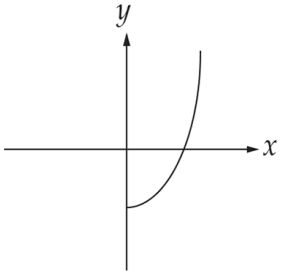
(C)



(D)



(E)

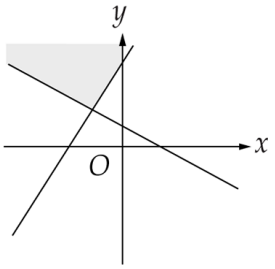


27. If $(x + y)^2 = (x - y)^2$, which of the following must be true?

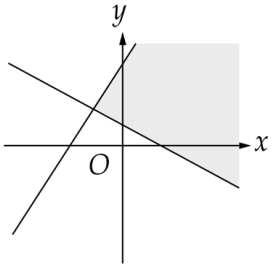
(A) $x = y$
(B) $x = -y$
(C) $x = 0$
(D) $y = 0$
(E) $x = 0$ or $y = 0$

28. Which of the following diagrams represents the solution set for $y \geq 2x + 3$ and $y \leq -\frac{1}{2}x + 1$?

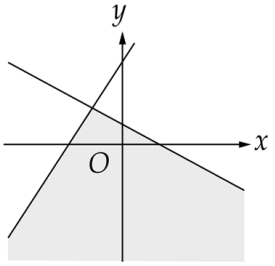
(A)



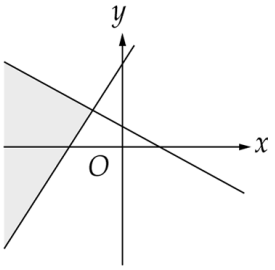
(B)



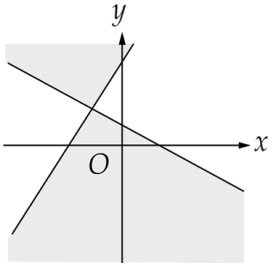
(C)



(D)



(E)



29. If $x \lozenge y = \sqrt{x^2 - y^2}$, then $10 \lozenge (-6) =$

(A) 2
(B) 8
(C) 16
(D) 32
(E) 64

30.

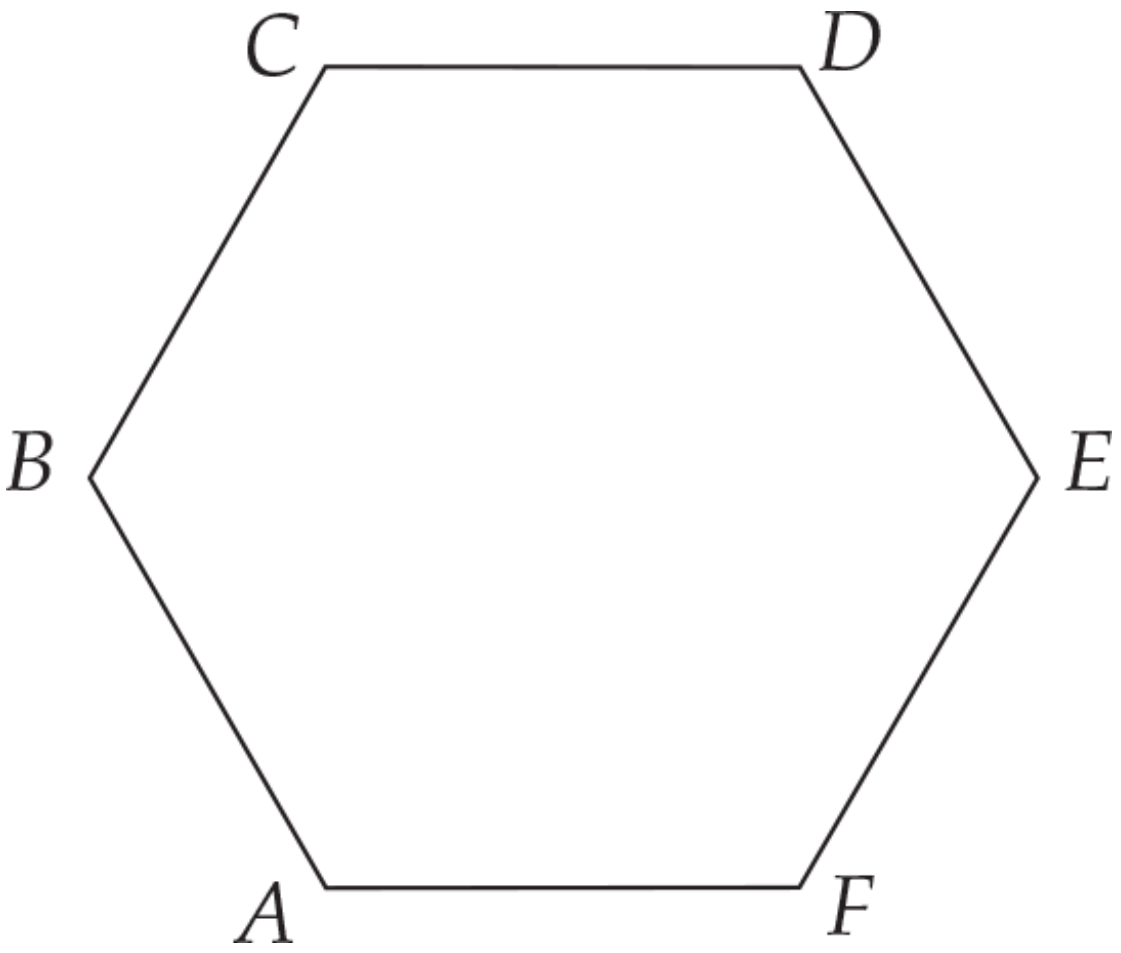


Figure 7

In Figure 7, if *ABCDEF* is a regular hexagon, what is the approximate length of $\overline{AE}$ if $AB = 4$?

(A) 5.65
(B) 5.73
(C) 6.00
(D) 6.93
(E) 8.00

31. Which of the following is an equation of a line that will never intersect with the line that has the equation $y = 4x + 2$?

(A) $y + 4x = 3$

(B) $2y + 4x = 2$

(C) $y - 4x = -3$

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

(E) $y + \frac{1}{4} = 3$

32. If $i = \sqrt{-1}$, then $(3 + i)(3 - i) =$

(A) 8
(B) 9
(C) 10
(D) $9 - i$
(E) $9 + i$

33.

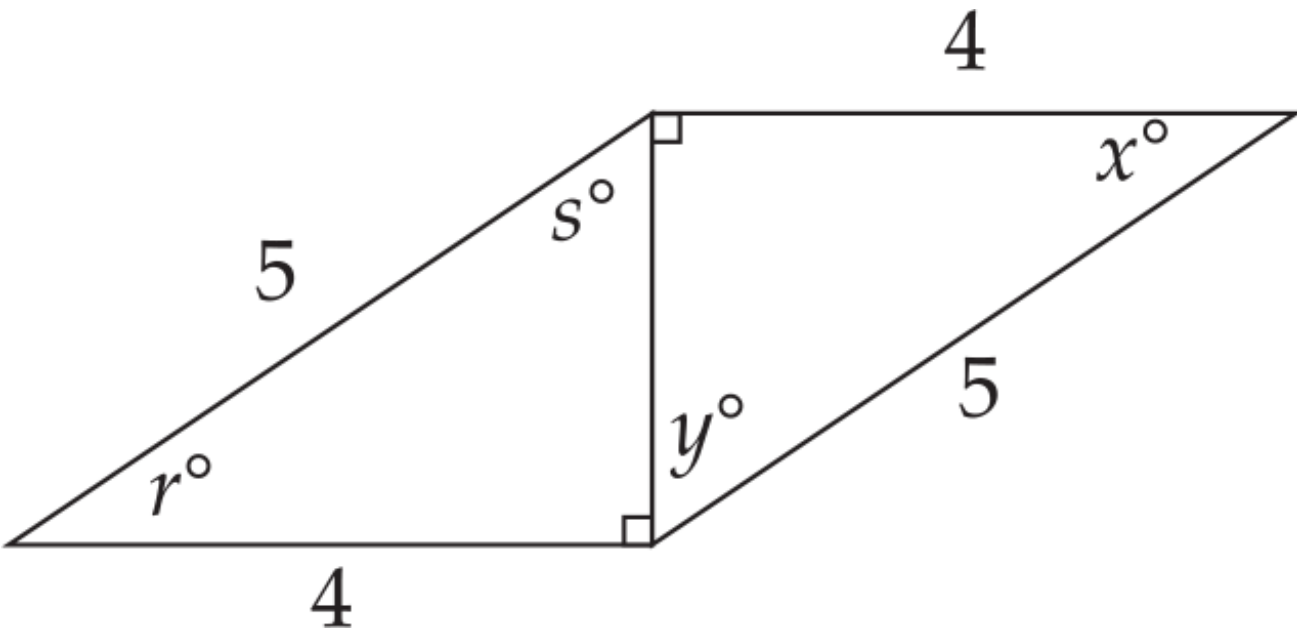


Figure 8

In Figure 8, which of the following must be true?

I. $\sin x = \frac{3}{5}$
II. $\tan y = \tan r$
III. $\cos x = \sin s$

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

34.

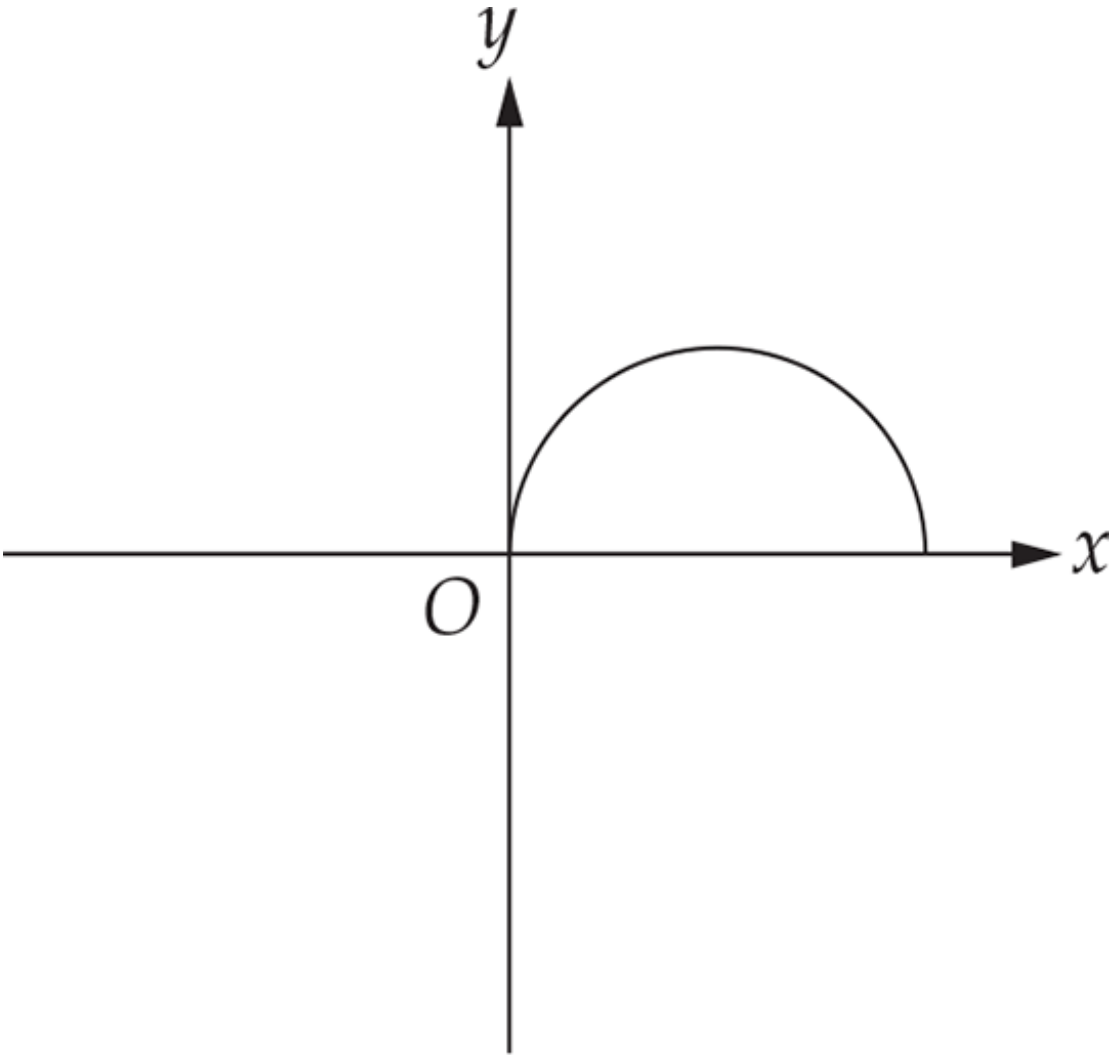


Figure 9

Figure 9 shows a semicircle that is the graph of the equation $y = \sqrt{6x - x^2}$. If the semicircle is rotated 360° about the *x*–axis, what is the volume of the sphere that is created?

(A) 6π
(B) 12π
(C) 18π
(D) 24π
(E) 36π

35. If $f(x) = 2x$ and $f(f(x)) = x + 1$, then $x =$

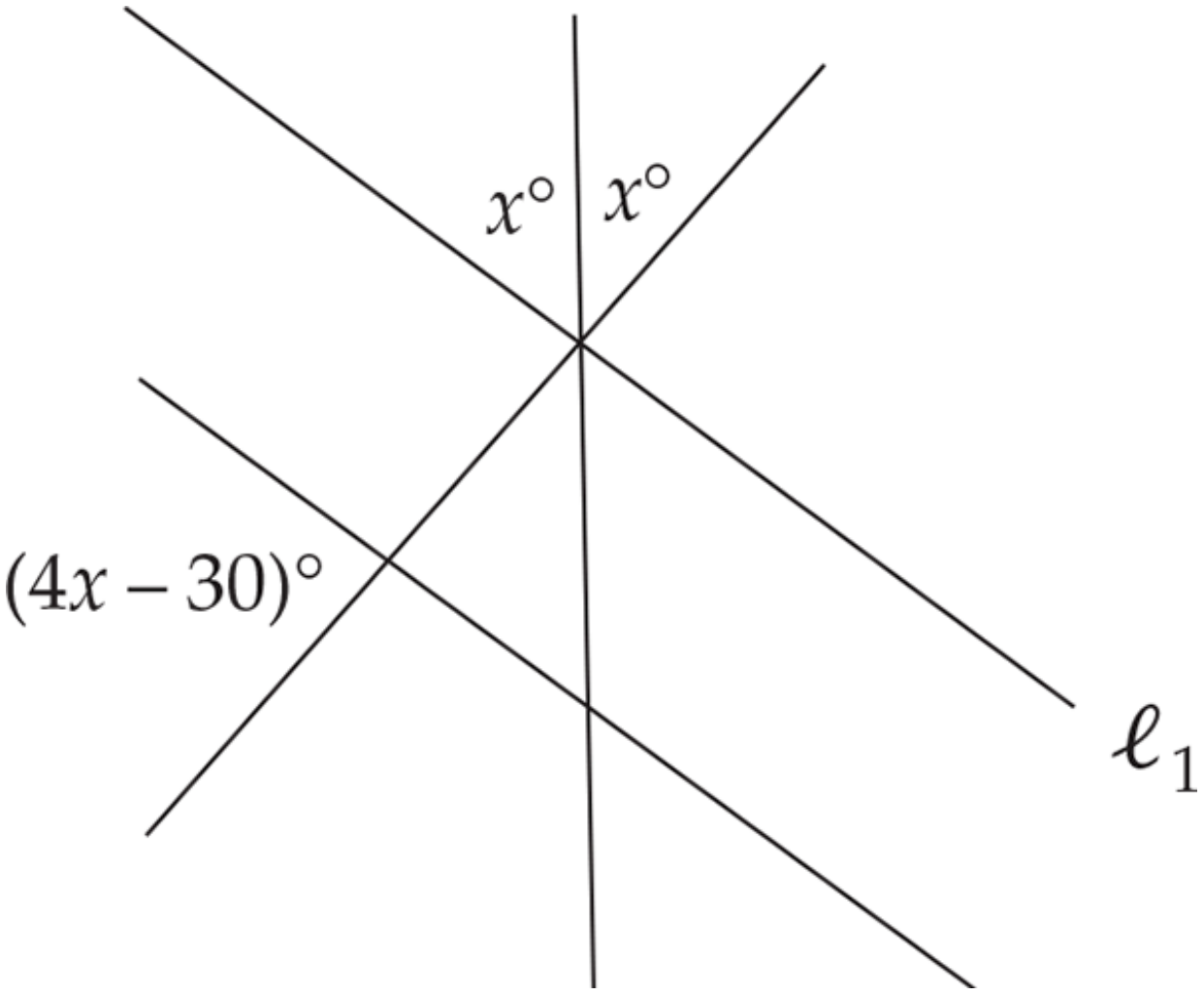
(A) $\frac{1}{3}$

(B) 1

(C) 2

(D) 3

(E) 5



36.

Figure 10

In Figure 10, if $\ell_1 \parallel \ell_2$, $x =$

(A) 15
(B) 25
(C) 30
(D) 35
(E) 40

37. Sally is interested in buying a car. If she has a choice of 3 colors (red, green, or blue), 2 body types (two or four doors), and 3 engine types (four, six, or eight cylinders), how many different models can she choose from?

(A) 6
(B) 8
(C) 12
(D) 16
(E) 18

38. Which of the following is the solution set for $|2x| < 4$ and $|x - 2| < 2$?

(A) $-2 < x < 0$
(B) $-2 < x < 2$
(C) $0 < x < 2$
(D) $0 < x < 4$
(E) $2 < x < 4$

39. If when $f(x)$ is divided by $3x + 1$, the quotient is $x^2 - x + 3$ and the remainder is 2, then $f(x) =$

(A) $3x^3 - 2x^2 - 8x + 3$
(B) $3x^3 - 2x^2 + 8x + 5$
(C) $3x^3 + 4x^2 + 8x + 1$
(D) $3x^3 - 4x^2 + 8x - 1$
(E) $3x^3 - 4x^2 + 8x - 3$

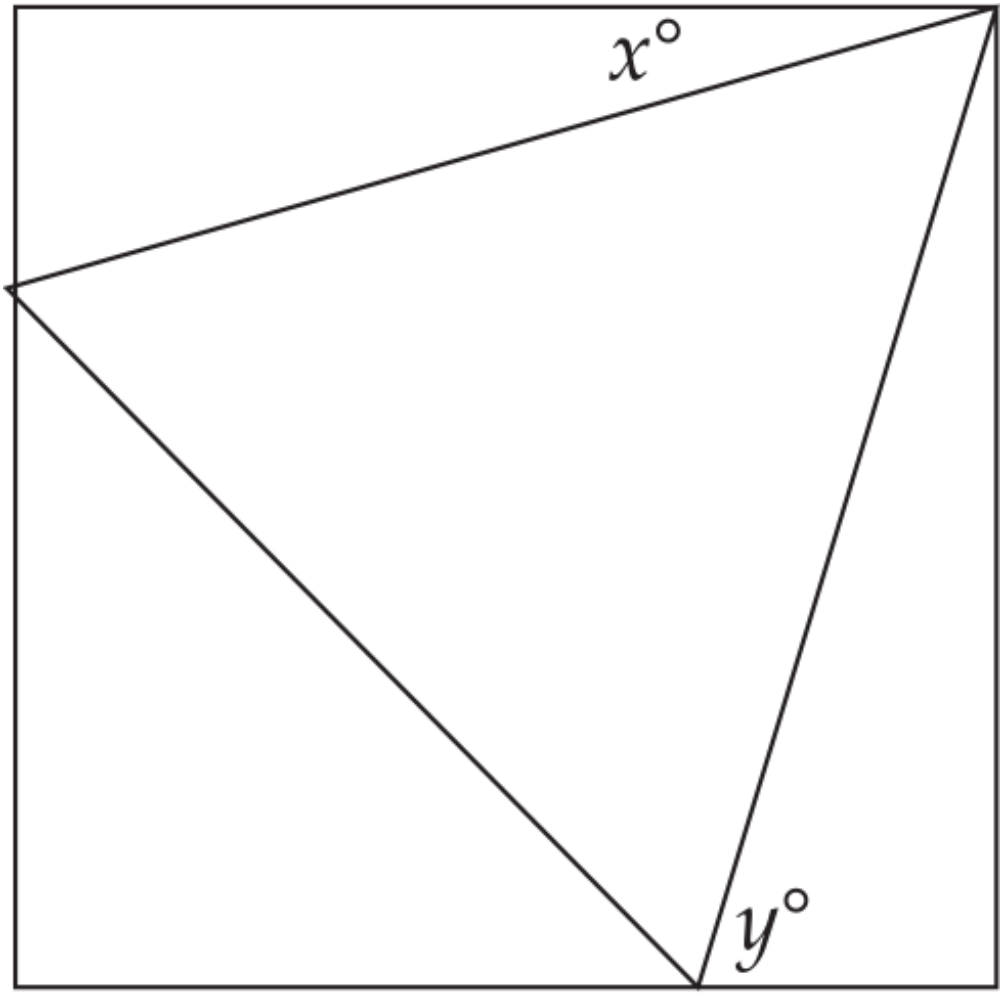
40. 

Figure 11

Figure 11 shows an equilateral triangle with two of its vertices on sides of a square and its third vertex on a vertex of the square. What is the value of $y - x$?

(A) 45
(B) 60
(C) 75
(D) 90
(E) It cannot be determined from the information given.

41. "If x is a member of set S, then x is not a member of set T," is logically equivalent to which of the following?

I. If x is a member of set T, then x is not a member of set S.
II. If x is not a member of set T, then x is a member of set S.
III. If x is not a member of set S, then x is a member of set T.

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

42.

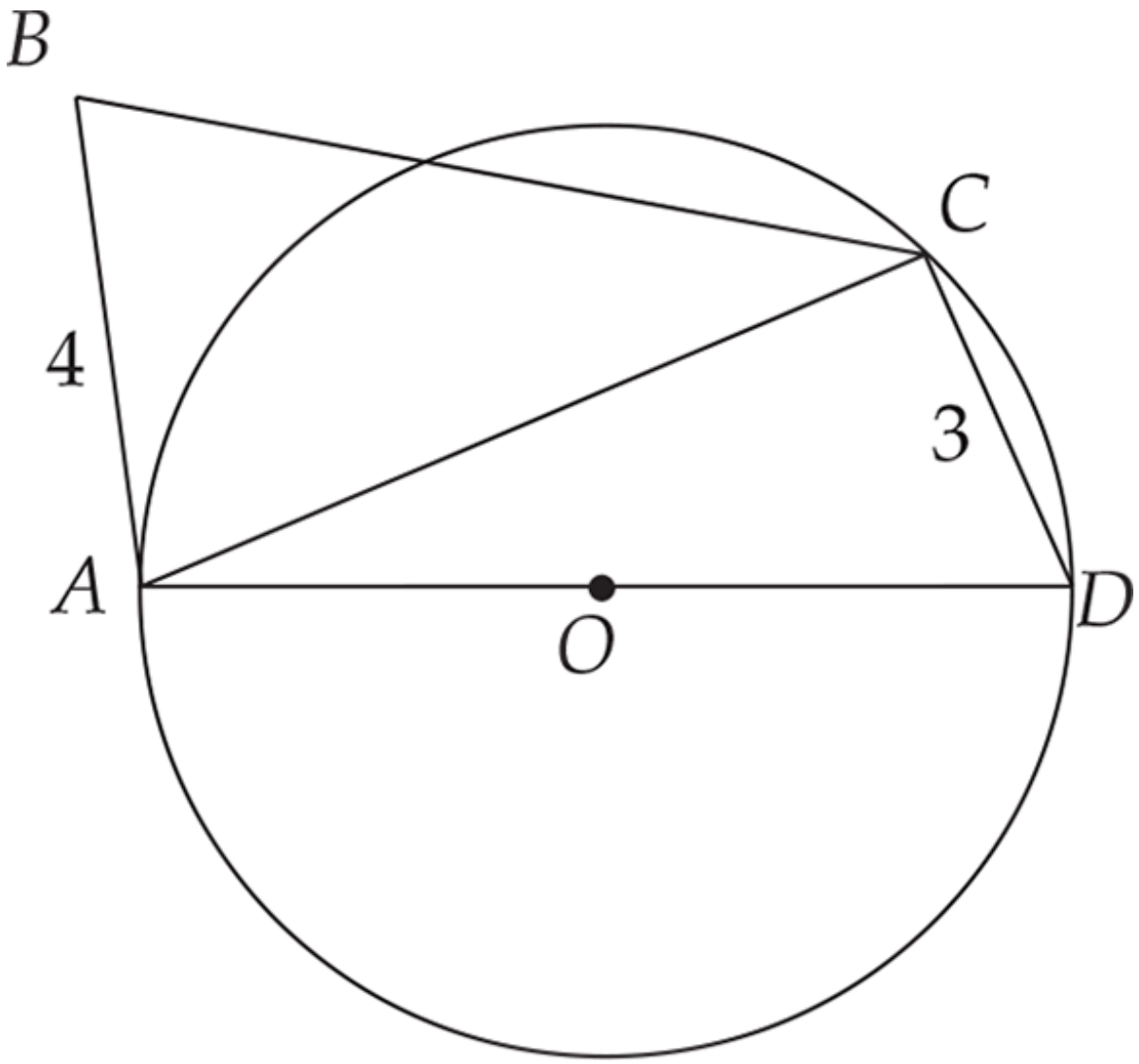


Figure 12

In Figure 12, if triangle *ABC* is an isosceles triangle of perimeter 20, what is the approximate area of the circle with center *O*?

(A) 26.83
(B) 33.65
(C) 44.17
(D) 57.33
(E) 229.34

43. If P is a point on the line $y = 2x$ in the first quadrant, and the distance from the origin to point P is 5, what are the approximate coordinates of point P?

(A) (2.24, 4.47)
(B) (3.00, 6.00)
(C) (4.00, 8.00)
(D) (4.47, 2.24)
(E) (4.72, 2.36)

44.

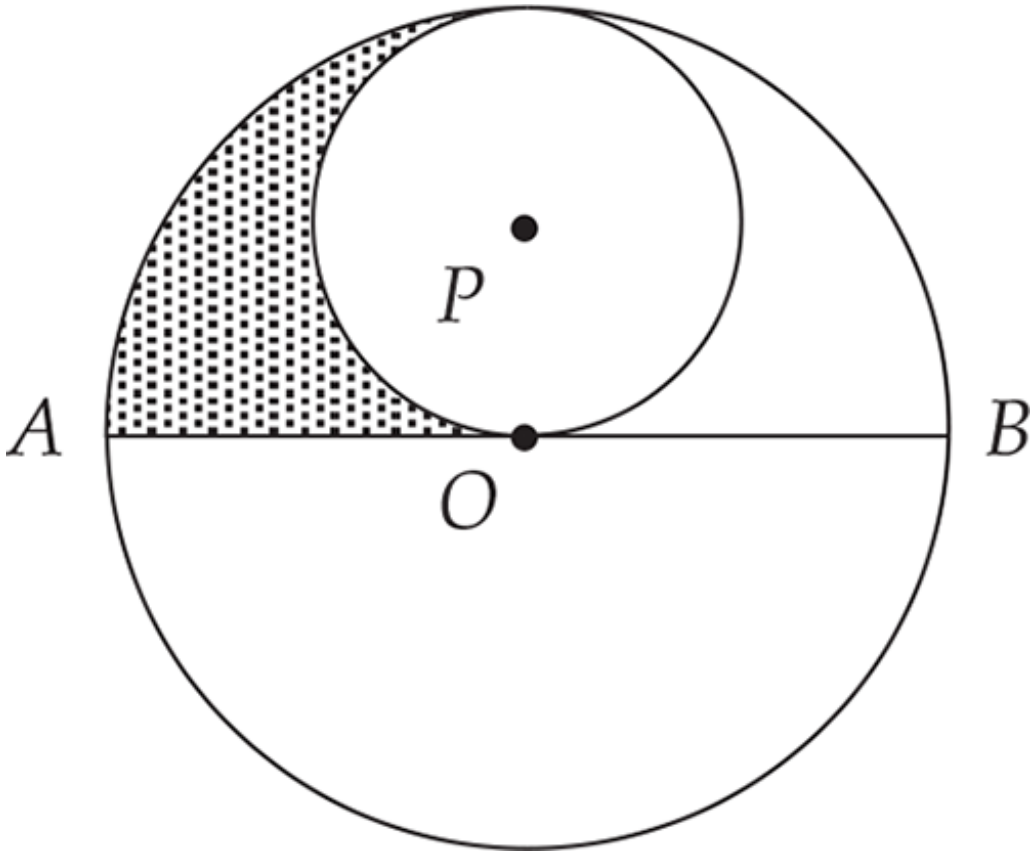


Figure 13

In Figure 13, circle O has diameter $\overline{AB}$ of length 8. If smaller circle P is tangent to diameter $\overline{AB}$ at point O and is also tangent to circle O, what is the approximate area of the shaded region?

(A) 3.14
(B) 6.28
(C) 9.42
(D) 12.57
(E) 25.13

45. On a number line, the coordinate of point A is 0, and the coordinate of point B is 6. If point P is located on the number line so that the distance from P to A is twice the distance from P to B, which of the following could be the coordinate of point P?

(A) 2 only
(B) 4 only
(C) 2 or 4
(D) 4 or 12
(E) 12 only

46. How many different-sized rectangular solids with a volume of 32 cubic units are there such that each dimension has an integer value?

(A) 4
(B) 5
(C) 6
(D) 10
(E) 12

47. If the roots of the equation $2x^2 + k = 8x$ are real, which of the following expresses all the possible values for k?

(A) $k \leq 8$
(B) $k \geq 8$
(C) $k \geq 4$
(D) $k \leq -8$
(E) $k \geq -8$

48. For what values of x is $x^2 + 6 < 5x$?

(A) $2 < x < 3$
(B) $-2 < x < 3$
(C) $-3 < x < -2$
(D) $-2 < x$ or $x > 3$
(E) $-3 < x$ or $x > 2$

49. In a cube with edge length 2, the distance from the center of one face to a vertex of the opposite face is

(A) 2.00
(B) 2.24
(C) 2.45
(D) 2.65
(E) 2.83

50. A certain stock begins the week trading at $87\frac{1}{2}$ per share. If the average gain for the next four days is $\frac{1}{2}$, by how much should the price of the stock increase during Friday so that the total gain for the stock during the entire five days is 5 percent?

(A) $1\frac{3}{4}$

(B) $1\frac{7}{8}$

(C) $2\frac{1}{8}$

(D) $2\frac{1}{4}$

(E) $2\frac{3}{8}$

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.

STOP

Answer Key

PRACTICE TEST 2

1. **D**
2. **A**
3. **B**
4. **E**
5. **C**
6. **A**
7. **A**
8. **C**
9. **A**
10. **D**
11. **B**
12. **C**
13. **D**
14. **D**
15. **D**
16. **A**
17. **E**
18. **D**
19. **E**
20. **C**
21. **B**
22. **E**
23. **D**
24. **E**
25. **B**
26. **B**
27. **E**
28. **D**
29. **B**
30. **D**
31. **C**
32. **C**
33. **D**
34. **E**

35. **A**
36. **D**
37. **E**
38. **C**
39. **B**
40. **B**
41. **A**
42. **D**
43. **A**
44. **B**
45. **D**
46. **B**
47. **A**
48. **A**
49. **C**
50. **E**

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New SAT Writing and Language Practice Tests: http://www.cracksat.net/sat/writing-language/

New SAT Math Practice Tests: http://www.cracksat.net/sat/math/

SAT Subjects Tests: http://www.cracksat.net/sat2/

SAT Downloads: http://www.cracksat.net/sat-downloads/

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ACT real tests and online practice tests:

http://www.crackact.com/

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