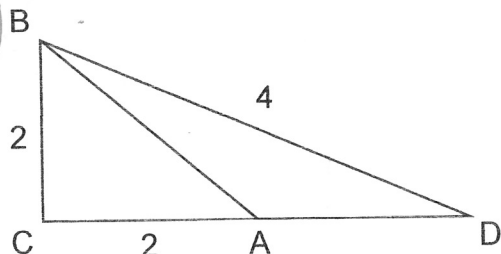


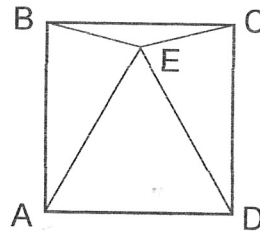
86.



DCB is a right triangle, and point A lies on the line segment CD. If $AC = BC = 2$, and $BD = 4$, find AD.

- F. 10
- G. $2\sqrt{3}$
- H. $2\sqrt{3} - 2$
- J. $\sqrt{3} + 2$
- K. None of these

53.



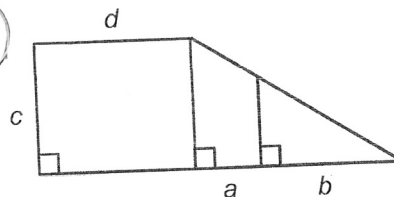
ABCD is a square, and AED is an equilateral triangle. Find the measure of angle BEC.

- A. 160°
- B. 150°
- C. 120°
- D. 115°
- E. 110°

84. Four lines on the plane have at most N common points. Find N .

- F. 7
- G. 6
- H. 5
- J. 4
- K. 3

93.



If the area of the trapezoid is $(d + b) \times c$, then what is a in terms of b ?

- A. $2b$
- B. b
- C. $b + 2$
- D. $2b + 2$
- E. None of these

89.

EF is a diameter of a circle with center R. D is a point on the same circle. If the measure of angle DRF is 42° , what is the measure of angle DEF?

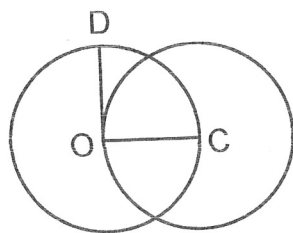
- A. 42°
- B. 41°
- C. 35°
- D. 21°
- E. 19°

77.

Three different lines on a plane divide it into k regions, which do not overlap. The number k **cannot** be

- A. 7
- B. 6
- C. 5
- D. 4
- E. k could be any number

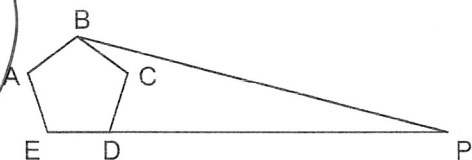
8.



Two congruent circles with centers at points O and C overlap each other. Radii $OD = CO = 3$. What is the length of the part of the left circle that is contained in the right circle?

- F. 4π
- G. 3π
- H. 2π
- J. π
- K. 0.5π

55.



ABCDE is a regular pentagon. If $\angle CBP = 20^\circ$, and $\overline{EDP}$ is a line segment, Find the degree measure of $\angle BPD$.

- A. 10°
- B. 12°
- C. 14°
- D. 16°
- E. 18°

93. What is the area of the triangle that the line $y = 2 - x$, the x -axis, and the y -axis form in the first quadrant?

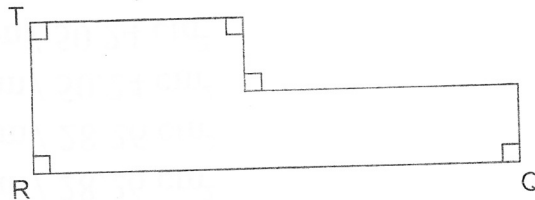
- A. 1 sq. unit
- B. 2 sq. units
- C. 3 sq. units
- D. 4 sq. units
- E. 6 sq. units

96.

If the area of the rectangle ABCD is 68 sq ft and the distance between vertex B and the diagonal AC is 2 ft, what is AC?

- F. 34 ft
- G. 17 ft
- H. 68 ft
- J. 64 ft
- K. None of these

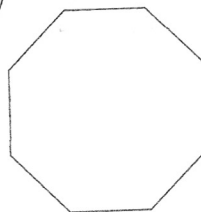
76.



TQ (not shown) = 17 cm, $TR = 8$ cm.
Find the perimeter of entire shape.

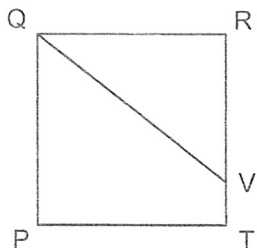
- F. 46 cm
- G. 44 cm
- H. 28 cm
- J. 26 cm
- K. 24 cm

86.



What is the degree measure of the smallest angle between two lines of symmetry of a regular octagon?

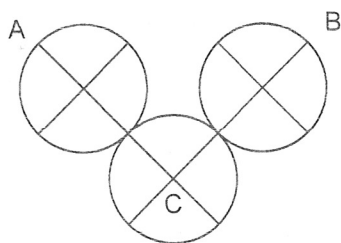
- F. 12.5°
- G. 20°
- H. 22.5°
- J. 30°
- K. 45°



The perimeter of the square PQRT is 4. The length of QV could be:

- A. 2
- B. 1.7
- C. 1.5
- D. 1.3
- E. 1

95.



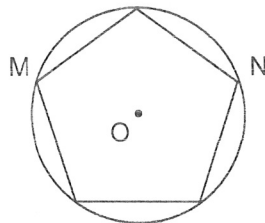
Three congruent circles with radii 2 cm are tangent to each other and divided into 4 congruent parts, as shown above. Find the distance AB.

- A. $8\sqrt{2}$
- B. $6\sqrt{2}$
- C. $6\sqrt{3}$
- D. $4\sqrt{2}$
- E. $4\sqrt{3}$

92. If $x^2y^3z^3 < 0$, which statement must be true?

- F. $xy > 0$
- G. $yz < 0$
- H. $xz < 0$
- J. $xyz < 0$
- K. $x < 0$

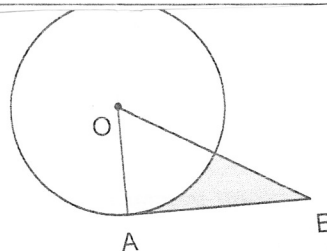
66.



Regular pentagon is inscribed into a circle. If O is the center of the circle, Find the degree measure of the angle MON.

- F. 288°
- G. 150°
- H. 144°
- J. 130°
- K. 120°

84.



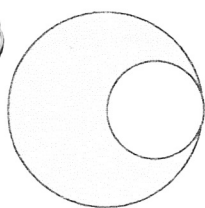
AB is tangent to circle O with radius 6, and $\angle ABO = 30^\circ$. Find the area of the shaded region.

- F. $18\sqrt{3} - 6\pi$
- G. $18 - 6\pi$
- H. $36\sqrt{3} - 6\pi$
- J. $6\sqrt{3} - 6\pi$
- K. $9\sqrt{3} - 6\pi$

100. What is the degree measure of the smallest angle between hour and minute hands of a clock at 11:10 PM?

- F. 70°
- G. 75°
- H. 85°
- J. 86°
- K. 90°

91.



In the diagram above, the diameter of the inner circle is equal to the radius of the large circle. Two circles tangent each other. What part of the large circle is shaded?

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

80.

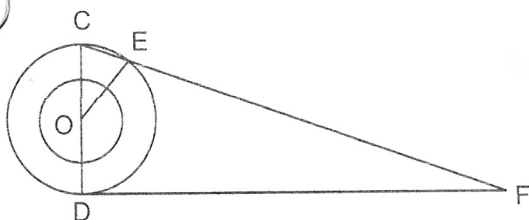
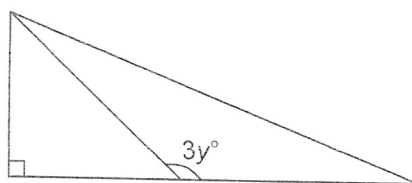


Figure is not drawn to scale.

Points C, D, and E are on the circumference of a circle. O is the center of the circle, and $CD = 5$. If $\angle CFD = 30^\circ$, find perimeter of $DOEF$.

- F. 10
- G. $12.5 + 5\sqrt{3}$
- H. $10 + \sqrt{3}$
- J. $10 + 5\sqrt{3}$
- K. 20

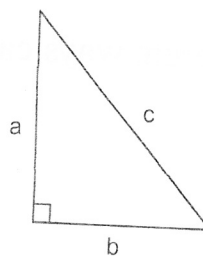
64.



In the diagram above, which of the following could be a value of y ?

- F. 20°
- G. 30°
- H. 35°
- J. 60°
- K. 65°

79.



Find the value of c , if $a + b = 9$, and $ab = 16$.

- A. 2
- B. 4
- C. 6
- D. 7
- E. 9

87. If a circle is inscribed into a square with the side of 4 inches, what is the distance between the vertex of the square and the point on the circle closest to it?

- A. 2
- B. $\sqrt{2}$
- C. $2\sqrt{2}$
- D. $2\sqrt{2} - 1$
- E. $2\sqrt{2} - 2$

100. What is the degree measure of the smaller angle between the hour and minute hands of the clock at 5:10 PM?

F. 110°
G. 105°
H. 100°
J. 95°
K. 90°

85. If $100 - 100^c = 99.999$, find c .

A. -2
B. -1.5
C. 0
D. 1
E. 1.5

72. If $2a = 3b$, and $6b = 5c$ what is the ratio of a to c ?

F. 5 : 4
G. 3 : 5
H. 4 : 5
J. 5 : 3
K. None of these

93. If $3a = 2b$, $5b = 3c$, and $5c = 4d$, what is the ratio of a to d ?

A. $\frac{1}{2}$
B. $\frac{5}{8}$
C. $\frac{3}{8}$
D. $\frac{1}{8}$
E. None of these

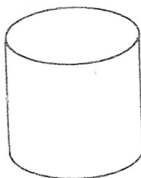
92. Line SR intersects the y -axis at $(0, -2)$ and passes through points $S(2, -3)$ and $R(x, -60)$. Find x .

F. 3
G. 88
H. 116
J. -116
K. None of these

79. n pens cost d dollars. How many pens you can buy for p dollars?

A. d / np
B. pd / n
C. np / d
D. nd / p
E. ndp

72.



Find the longest distance between a point on the top circumference and a point on the base circumference of the cylinder, if the radius of the base is 4 and the height of the cylinder is 6.

F. 10
G. 9
H. 8
J. 6
K. 5

59. If $(2x - 3) \div x = x + 5$, what is the value of $x^2 + 3x + 3$?

- A. -3
- B. -2
- C. -1
- D. 0
- E. 17

55. The operation $\odot$ is defined for all nonzero numbers by $k \odot t = -k^2 - t$. Find $(5 \odot -24) \odot 2$.

- A. 2399
- B. 79
- C. 0
- D. -2
- E. -3

93. If $-1 < x < 0$, which of the following statements are true?

- I. $x < x^2$
- II. $x < x^3$
- III. $x^3 < x^2$

- A. I only
- B. II only
- C. III only
- D. I and III only
- E. I, II, and III

94. If $a = 2x - 1$ and $b = 3 - x$, which of the following expresses a in terms of b ?

- F. $5 - 2b$
- G. $6 - b$
- H. $b - 5$
- J. $2b - 6$
- K. $2b - 5$

89. If $(x - 1)^4 = 16$, which of the following could be the value of $x - 5$?

- A. -6
- B. -4
- C. -3
- D. 3
- E. 2

96. If $y^2 - 5x^2 = 11$, and x and y are positive integers, what could be the value of y ?

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

86. If $-2 < x < 6$, and x is an integer, what is the smallest possible value of $x^2 - 3$?

- F. -4
- G. -3
- H. -2
- J. -1
- K. 0

67.

If D and C are two positive numbers, how many of the following expressions are always positive?

$$(D + C)$$

$$D \div C$$

$$DC$$

$$C \div D$$

$$(D - C)$$

$$|C - 2D|$$

$$(C - D)$$

- A. 6
- B. 5
- C. 4
- D. 3
- E. None

92. 3, 8, 13, 18, 23, 28, 33, ...

What is the difference between the 60th and the 70th terms in the sequence above?

- F. 40
- G. 45
- H. 50
- J. 55
- K. 60

53.

Ann has a piggy bank with 48 coins, all of which are dimes and nickels. The total amount of money in the piggy bank is \$3.90. How many more dimes are there than nickels?

- A. 20
- B. 18
- C. 16
- D. 14
- E. 12

94. If you write down the sequence all positive integers from 1 to 50 in a row, what is the combined number of times that digits 3 and 7 will appear in the sequence?

- F. 28
- G. 20
- H. 18
- J. 8
- K. 7

74.

A train traveled the first 200 miles of its trip at a speed of 50 mph and the next 130 miles at a speed of 65 mph. What was the average speed of the train during the whole trip?

- F. 60.5 mph
- G. 60 mph
- H. 58 mph
- J. 57.5 mph
- K. 55 mph

73.

The sum of n integers is 280. If the average of all these integers is 14, what is n ?

- A. 10
- B. 18
- C. 17
- D. 20
- E. None of these

94.

What is the sum of all distinct prime factors of 323?

- F. 12
- G. 15
- H. 36
- J. 323
- K. 324