

**24HourAnswers.com**

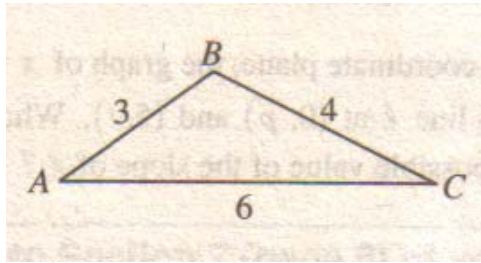
**Online Homework**

**Focused Exercises for Math SAT**

**Skill Set 8: Triangles**

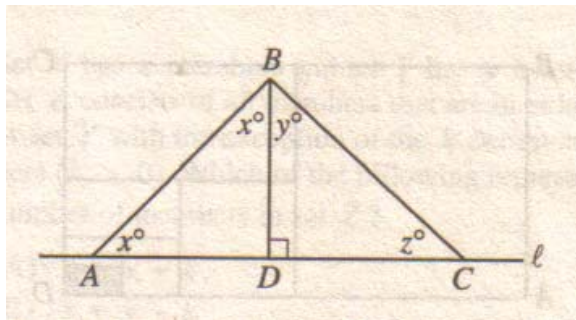
Many of the problems in this exercise set came from The College Board, writers of the SAT exam.

1.



Each angle of  $\triangle ABC$  above has the same measure as an angle in  $\triangle XYZ$  (not shown). If the length of one side of  $\triangle XYZ$  is 24, what is one possible perimeter of  $\triangle XYZ$ ?

2.

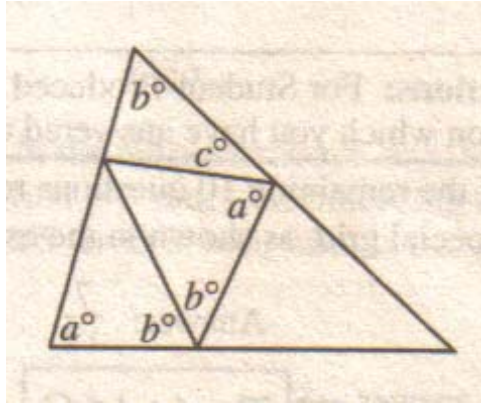


NOTE: Figure not drawn to scale.

In the figure above,  $AD = 1$  and  $DC = \sqrt{3}$ . What is the value of  $z$ ?

- (A) 15
- (B) 20
- (C) 25
- (D) 30
- (E) 35

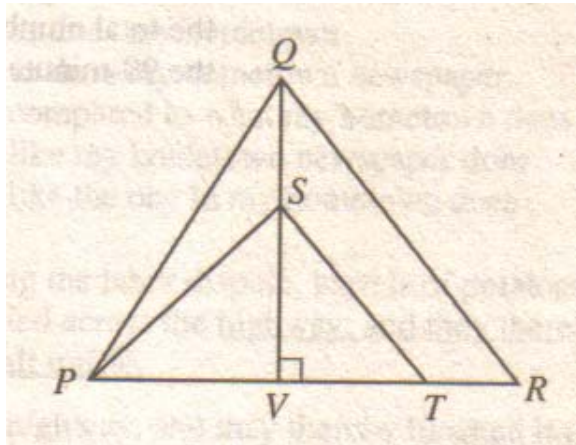
3.



In the figure above, what is the value of  $c$  in terms of  $a$  and  $b$ ?

- (A)  $a + 3b - 180$
- (B)  $2a + 2b - 180$
- (C)  $180 - a - b$
- (D)  $360 - a - b$
- (E)  $360 - 2a - 3b$

4.

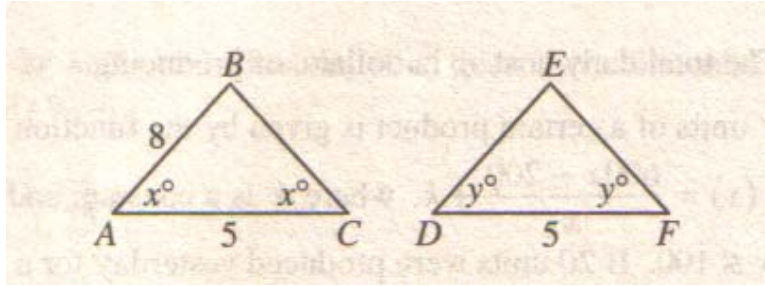


NOTE: Figure not drawn to scale.

In  $\triangle PQR$  above,  $\frac{QS}{QV} = \frac{1}{3}$  and  $\frac{PT}{PR} = \frac{3}{4}$ .

What is the value of the fraction  $\frac{\text{area } \triangle PST}{\text{area } \triangle PQR}$  ?

5.

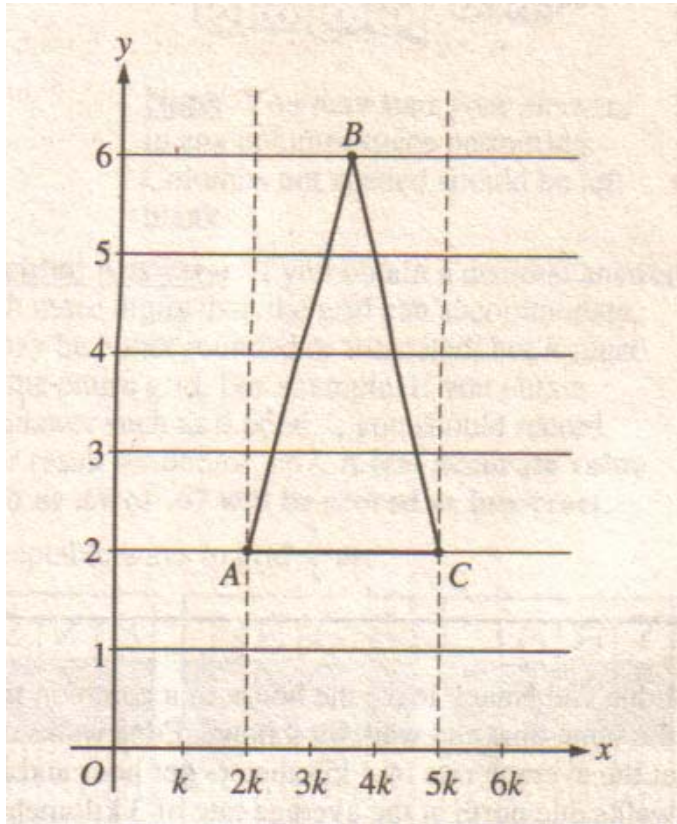


NOTE: Figures not drawn to scale.

If  $y = 60$  in  $\triangle DEF$  above, how much greater is the perimeter of  $\triangle ABC$  than the perimeter of  $\triangle DEF$ ?

- (A) 0
- (B) 3
- (C) 6
- (D) 8
- (E) 9

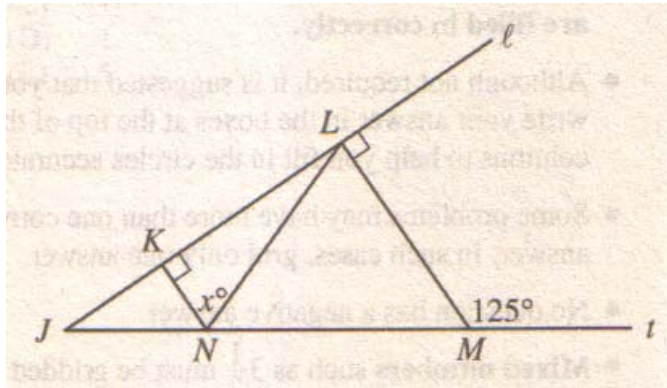
6.



In the figure above, the scale on the x-axis is different from the scale on the y-axis. If the area of  $\triangle ABC$  is 18, what is the value of  $k$ ?

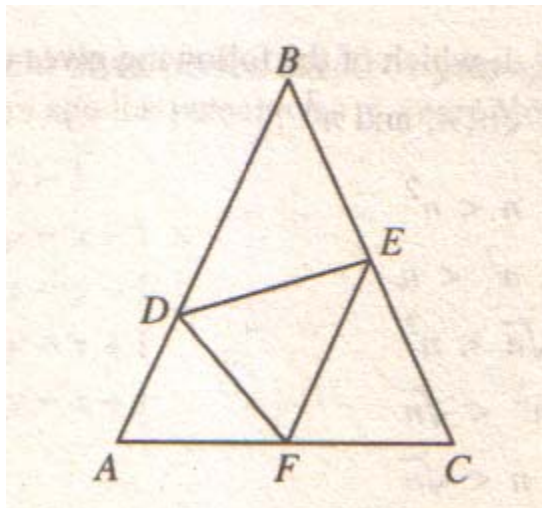
- (A)  $\frac{3}{10}$
- (B)  $\frac{3}{4}$
- (C)  $\frac{6}{5}$
- (D)  $\frac{3}{2}$
- (E) 3

7.



In the figure above,  $\overline{KN} \perp \overline{JL}$  and  $\overline{LM} \perp \overline{JL}$ . If the lengths of  $\overline{LN}$  and  $\overline{LM}$  are equal, what is the value of  $x$ ?

8.

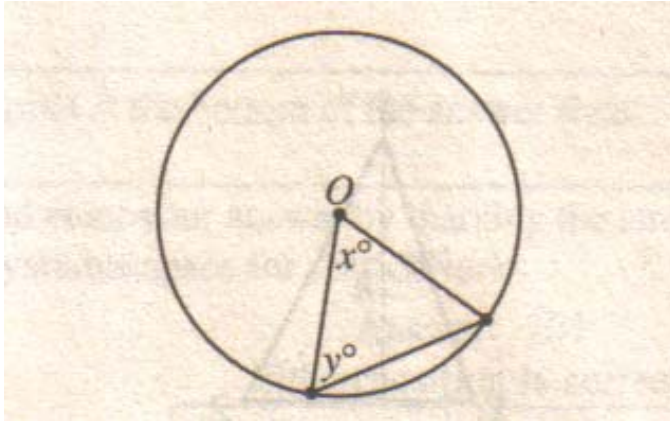


NOTE: Figure not drawn to scale.

In the figure above,  $AB = BC$  and  $DE = EF = DF$ . If the measure of  $\angle ABC$  is  $30^\circ$  and the measure of  $\angle BDE$  is  $50^\circ$ , what is the measure of  $\angle DFA$ ?

- (A)  $30^\circ$
- (B)  $35^\circ$
- (C)  $40^\circ$
- (D)  $45^\circ$
- (E)  $50^\circ$

9.

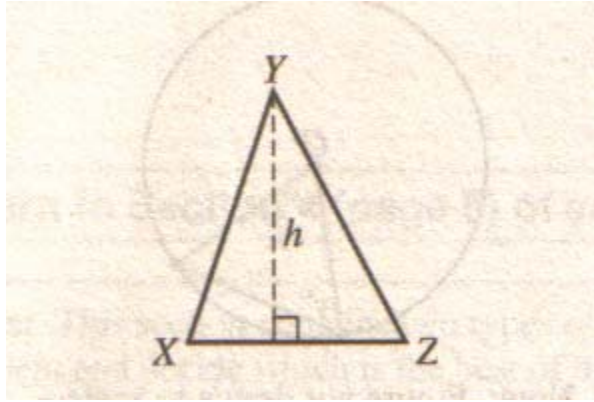


NOTE: Figure not drawn to scale.

In the figure above, point  $O$  is the center of the circle. If  $x = 40$ , what is the value of  $y$ ?

- (A) 40
- (B) 50
- (C) 60
- (D) 70
- (E) 80

10.



In  $\triangle XYZ$  above,  $XZ$  is  $\frac{6}{7}$  of  $h$ , the length of the altitude. What is the area of  $\triangle XYZ$  in terms of  $h$ ?

(A)  $\frac{h^2}{3}$

(B)  $\frac{3h^2}{7}$

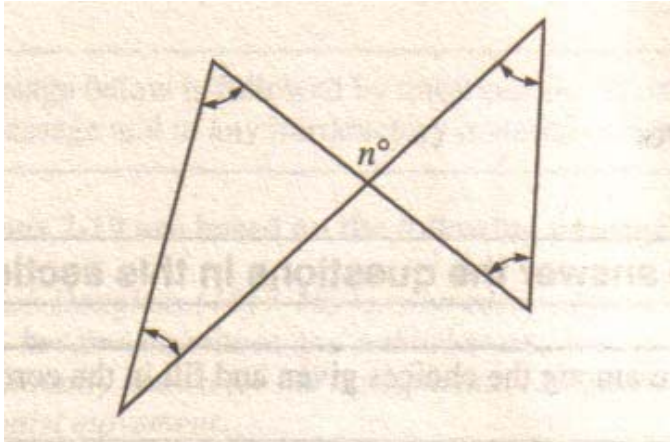
(C)  $\frac{3h}{7}$

(D)  $\frac{6h^2}{7}$

(E)  $\frac{12h^2}{7}$



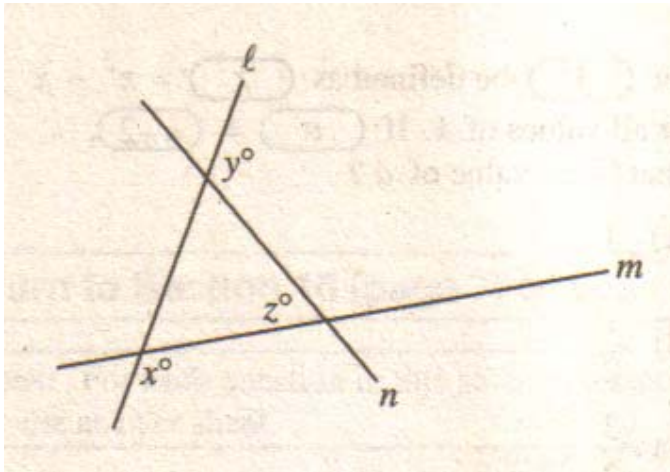
11.



In the figure above, what is the sum, in terms of  $n$ , of the degree measures of the four angles marked with arrows?

- (A)  $n$
- (B)  $2n$
- (C)  $180 - n$
- (D)  $360 - n$
- (E)  $360 - 2n$

12.

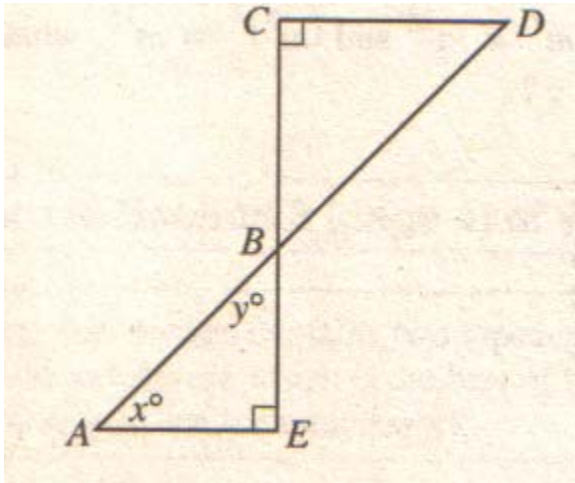


NOTE: Figure not drawn to scale.

In the figure above, if  $z = 30$ , what is the value of  $x + y$  ?

- (A) 60
- (B) 150
- (C) 180
- (D) 210
- (E) 330

13.

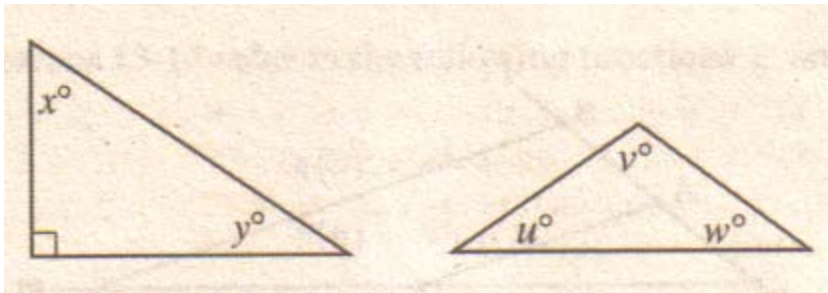


NOTE: Figure not drawn to scale.

In the figure above,  $\overline{AE}$  and  $\overline{CD}$  are each perpendicular to  $\overline{CE}$ . If  $x = y$ , the length of  $\overline{AB}$  is 4, and the length of  $\overline{BD}$  is 8, what is the length of  $\overline{CE}$  ?

- (A)  $3\sqrt{2}$  (approximately 4.24)
- (B)  $6\sqrt{2}$  (approximately 8.49)
- (C)  $8\sqrt{2}$  (approximately 11.31)
- (D)  $10\sqrt{2}$  (approximately 14.14)
- (E)  $12\sqrt{2}$  (approximately 16.97)

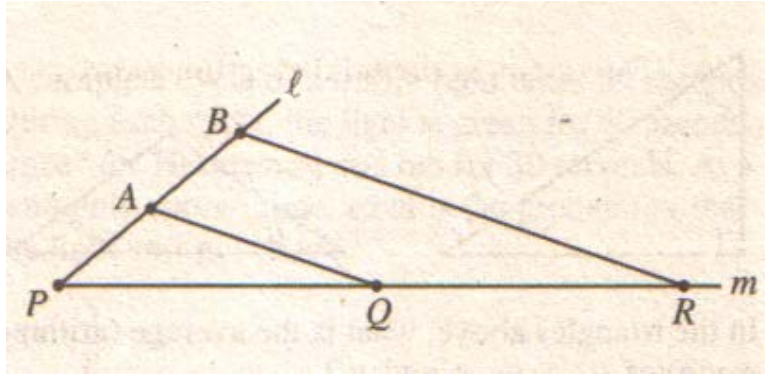
14.



In the triangles above, what is the average (arithmetic mean) of  $u$ ,  $v$ ,  $w$ ,  $x$ , and  $y$  ?

- (A) 21
- (B) 45
- (C) 50
- (D) 52
- (E) 54

15.

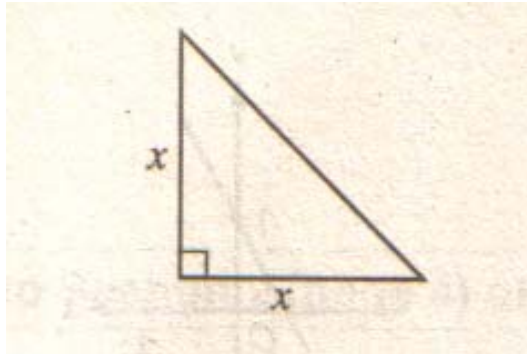


NOTE: Figure not drawn to scale.

In the figure above, points  $P$ ,  $A$ , and  $B$  are equally spaced on line  $\ell$  and points  $P$ ,  $Q$ , and  $R$  are equally spaced on line  $m$ . If  $PB = 4$ ,  $PR = 6$ , and  $AQ = 4$ , what is the perimeter of quadrilateral  $QABR$  ?

- (A) 13
- (B) 14
- (C) 15
- (D) 16
- (E) 17

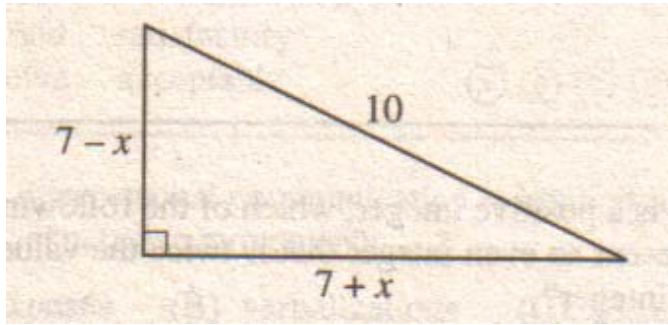
16.



In the figure above, the perimeter of the triangle is  $4 + 2\sqrt{2}$ . What is the value of  $x$  ?

- (A) 2
- (B) 4
- (C)  $\sqrt{2}$
- (D)  $2\sqrt{2}$
- (E)  $2 + \sqrt{2}$

17.

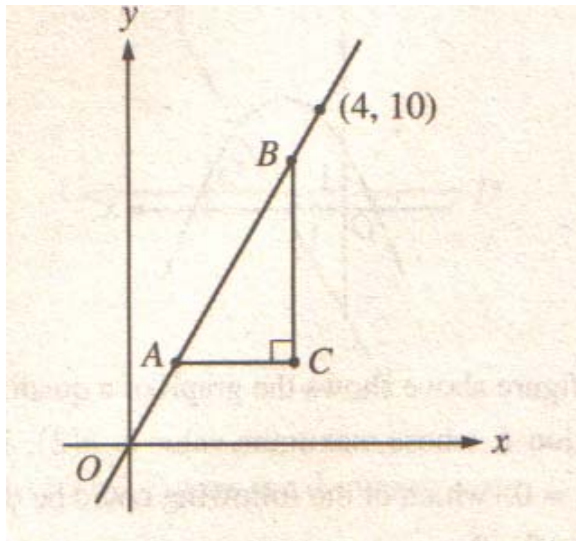


NOTE: Figure not drawn to scale.

The figure above is a right triangle. What is the value of  $49 + x^2$  ?

- (A) 50
- (B) 51
- (C) 72
- (D) 98
- (E) 100

18.

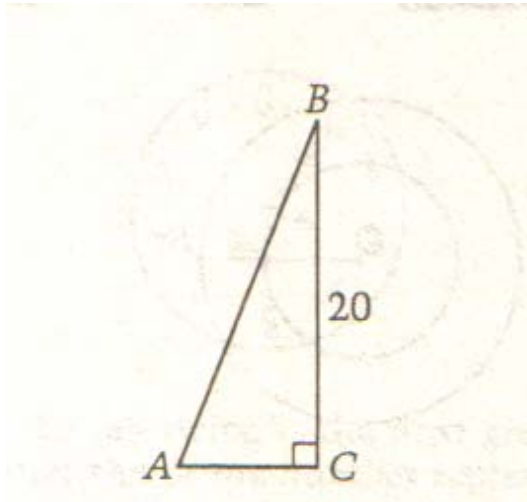


NOTE: Figure not drawn to scale.

In the figure above, if the legs of triangle  $ABC$  are parallel to the axes, which of the following could be the lengths of the sides of triangle  $ABC$  ?

- (A) 2, 5, and  $\sqrt{29}$
- (B) 2, 5, and 7
- (C) 3, 3, and  $3\sqrt{2}$
- (D) 3, 4, and 5
- (E) 4, 5, and  $\sqrt{41}$

19.

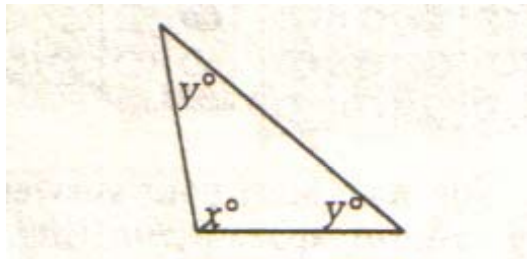


NOTE: Figure not drawn to scale.

If the area of the triangle in the figure above is 100, what is the length of side  $AB$  ?

- (A)  $10\sqrt{3}$  (approximately 17.32)
- (B)  $10\sqrt{5}$  (approximately 22.36)
- (C) 20
- (D) 24
- (E) 25

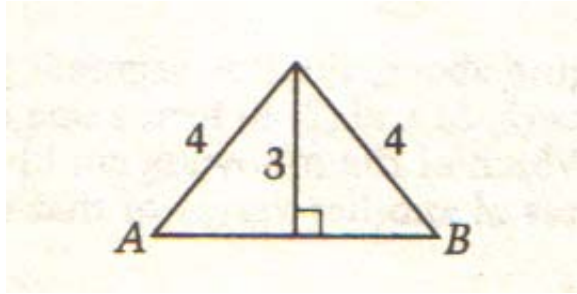
20.



NOTE: Figure not drawn to scale.

In the triangle above,  $x$  and  $y$  are integers. If  $35 < y < 40$ , what is one possible value of  $x$  ?

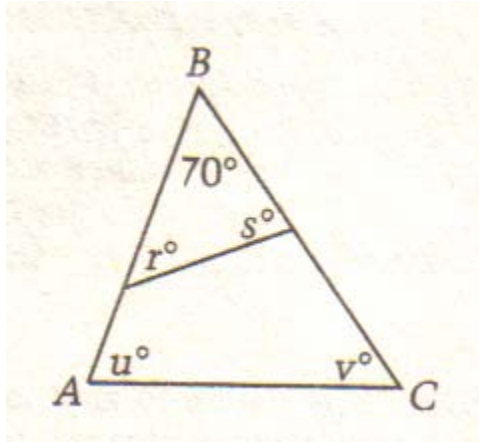
21.



In the figure above, what is the length of  $AB$ ?

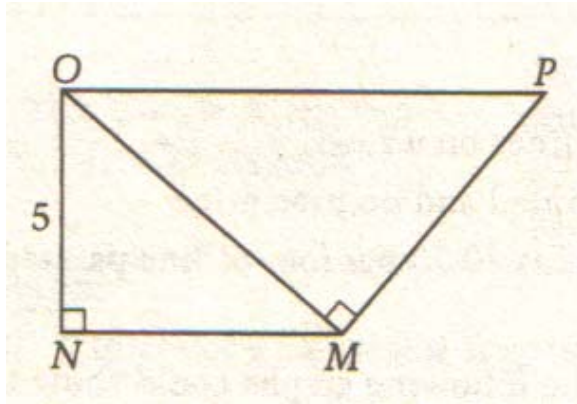
- (A) 5
- (B) 7
- (C)  $2\sqrt{7}$  (approximately 5.29)
- (D)  $4\sqrt{2}$  (approximately 5.66)
- (E)  $4\sqrt{3}$  (approximately 6.93)

22.



In  $\triangle ABC$  above, what is the value of  $r + s + u + v$ ?

23.

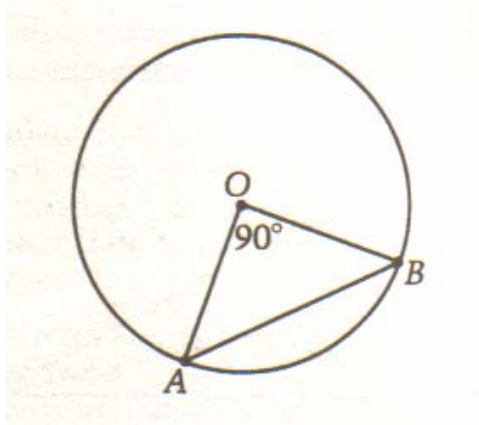


NOTE: Figure not drawn to scale.

In the figure above,  $MNO$  and  $OPM$  are isosceles right triangles. What is the length of  $OP$ ?

- (A) 8
- (B) 10
- (C)  $5\sqrt{3}$  (approximately 8.66)
- (D)  $7\sqrt{2}$  (approximately 9.90)
- (E)  $5\sqrt{5}$  (approximately 11.18)

24.

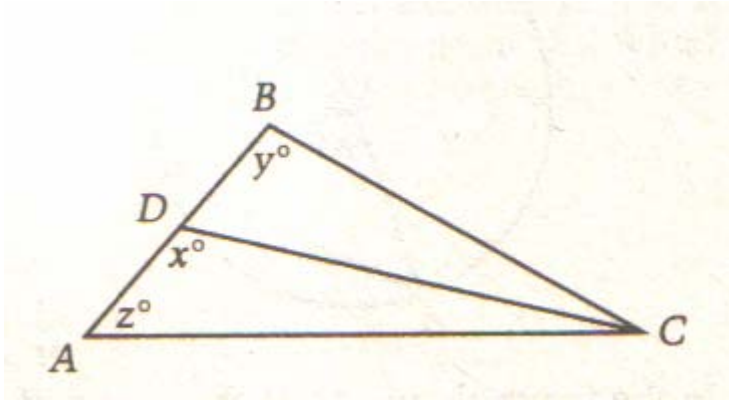


In the figure above, O is the center of the circle of radius 10. What is the area of  $\triangle AOB$ ?

- (A) 25
- (B) 50
- (C)  $\frac{25}{2}\pi$
- (D)  $20\pi$
- (E)  $25\pi$



25.

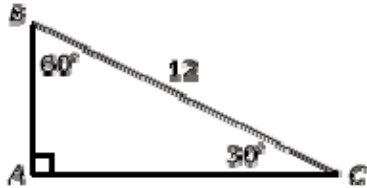


NOTE: Figure not drawn to scale.

In  $\triangle ABC$  above,  $AB = BC$  and  $CD$  bisects  $\angle C$ . If  $y = \frac{1}{3}x$ , then  $z =$

- (A) 40
- (B) 60
- (C) 64
- (D) 72
- (E) 80

26.



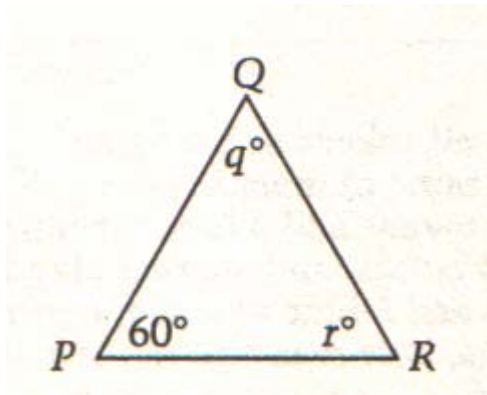
If triangle  $ABC$  above is congruent to triangle  $DEF$  (not shown), which of the following must be the length of one side of triangle  $DEF$ ?

- (A) 18
- (B) 24
- (C)  $3\sqrt{6}$
- (D)  $6\sqrt{3}$
- (E) It cannot be determined from the information given.

27. If the points  $P(-2, 6)$ ,  $Q(-2, 1)$ , and  $R(2, 1)$  are vertices of a triangle, what is the area of the triangle?
28. Which of the following CANNOT be the lengths of the sides of a triangle?

- (A) 1, 1, 1
- (B) 1, 2, 4
- (C) 1, 75, 75
- (D) 2, 3, 4
- (E) 5, 6, 8

29.

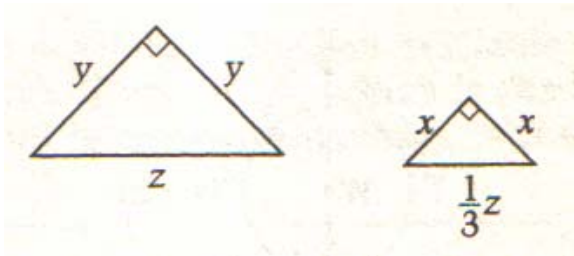


NOTE: Figure not drawn to scale.

In  $\triangle PQR$  above,  $PQ > QR$ . Which of the following must be true?

- (A)  $PR = PQ$
- (B)  $PR < QR$
- (C)  $q = r$
- (D)  $q = 50$
- (E)  $q > 60$

30.

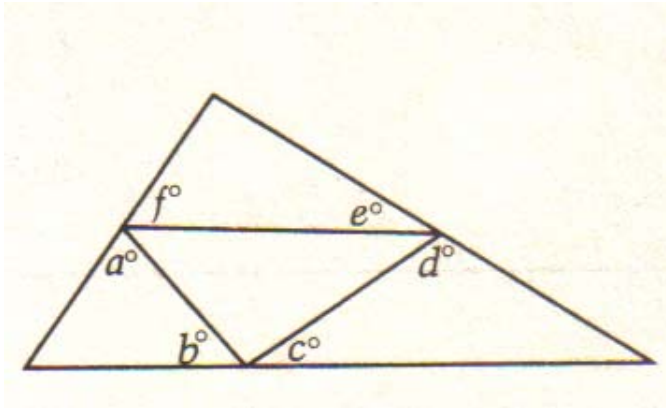


NOTE: Figure not drawn to scale.

In the figures above, what is the value of  $y$  in terms of  $x$  ?

- (A)  $\sqrt{2} x$  (approximately  $1.41x$ )
- (B)  $2x$
- (C)  $2\sqrt{2} x$  (approximately  $2.83x$ )
- (D)  $3x$
- (E)  $3\sqrt{2} x$  (approximately  $4.24x$ )

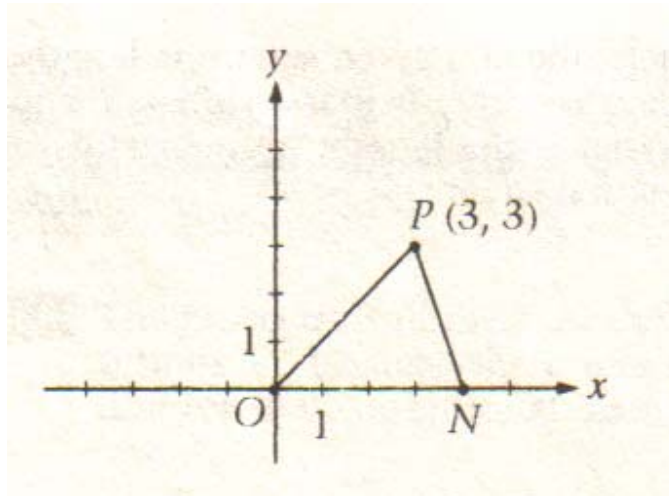
31.



In the figure above, what is the value of  $a + b + c + d + e + f$  ?

- (A) 180
- (B) 270
- (C) 360
- (D) 450
- (E) 540

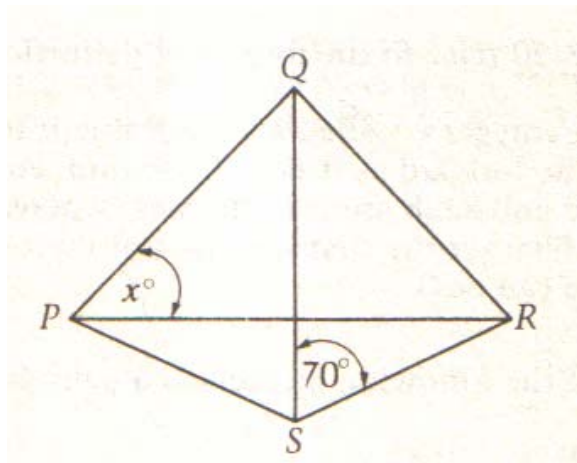
32.



In the figure above, for which of the following coordinates of a point  $T$  (not shown) will  $\triangle OTN$  have the same perimeter as  $\triangle OPN$ ?

- (A) (0, 3)
- (B) (1, 3)
- (C) (2, 3)
- (D) (4, 3)
- (E) (5, 3)

33.

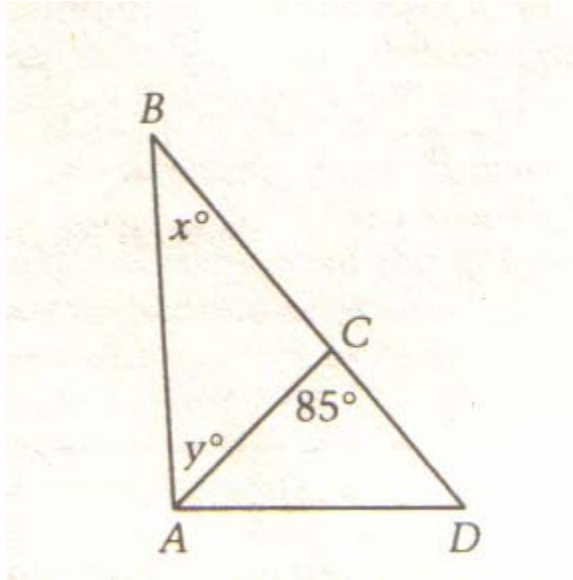


NOTE: Figure not drawn to scale.

In the quadrilateral above, if  $PQ = SQ = RQ$  and  $PS = SR$ , then  $x =$

- (A) 30
- (B) 40
- (C) 50
- (D) 60
- (E) 70

34.

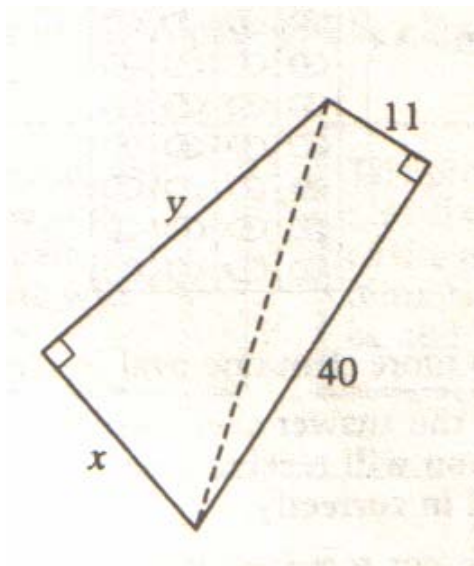


NOTE: Figure not drawn to scale.

In  $\triangle ABD$  above, if  $y = 40$ , what is the value of  $x$  ?

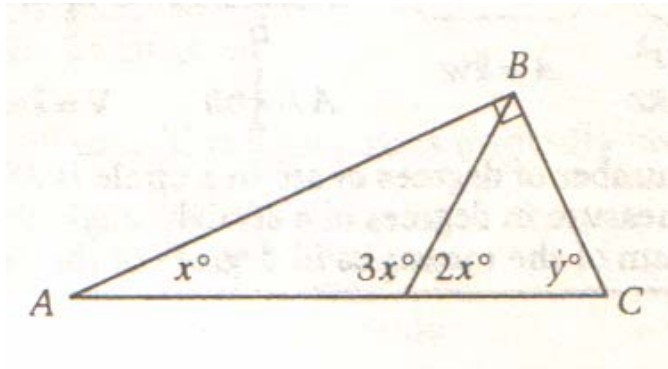
- (A) 25
- (B) 30
- (C) 35
- (D) 40
- (E) 45

35.



In the figure above, what is the value of  $x^2 + y^2$  ?

36.

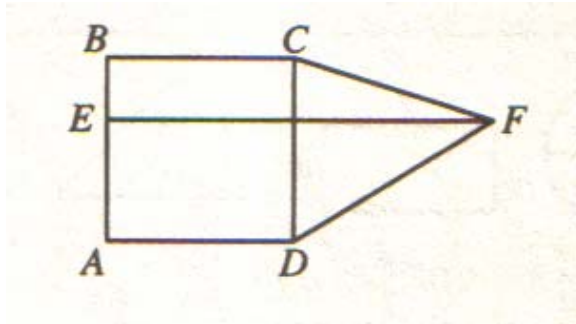


NOTE: Figure not drawn to scale.

In right triangle  $ABC$  above, what is the value of  $y$ ?

- (A) 45
- (B) 48
- (C) 54
- (D) 60
- (E) 72

37.

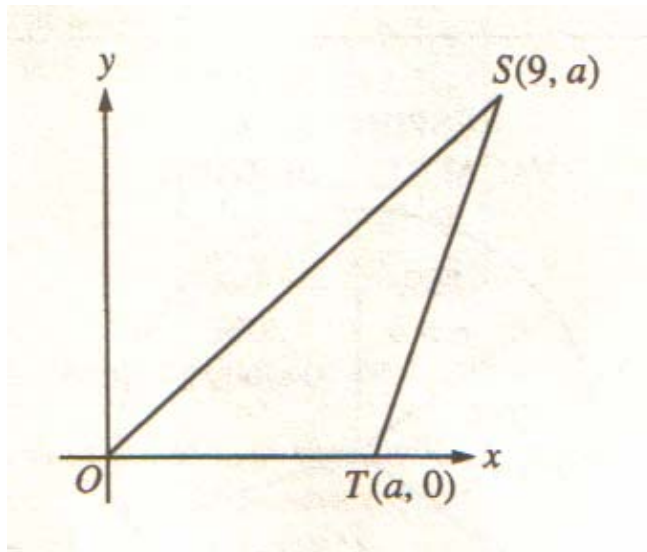


NOTE: Figure not drawn to scale.

In the figure above, line segment  $EF$  divides square  $ABCD$  into two rectangles, and side  $CD$  bisects  $EF$ . If  $AB = 4$ , what is the area of  $\triangle DCF$ ?

- (A) 9
- (B) 8
- (C) 7
- (D) 6
- (E) 5

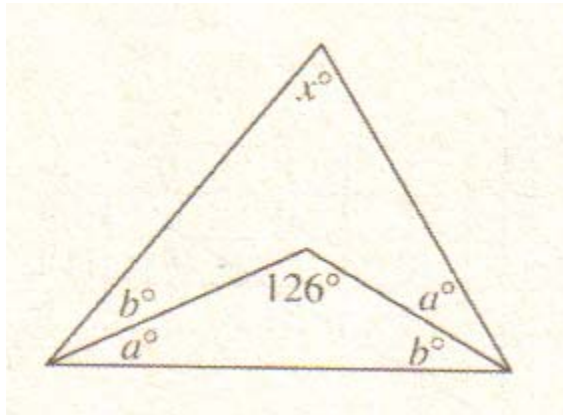
38.



NOTE: Figure not drawn to scale.

In the  $xy$ -plane above, the area of  $\triangle OST$  is 8. What is the value of  $a$ ?

39.

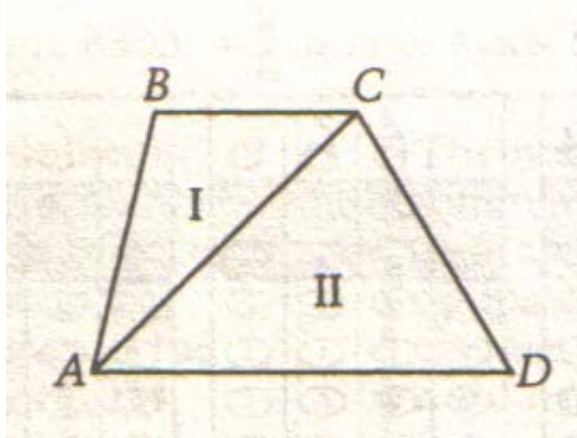


NOTE: Figure not drawn to scale.

In the figure above, what is the value of  $x$ ?

- (A) 72
- (B) 70
- (C) 68
- (D) 66
- (E) 64

40.



In the figure above, the area of triangle I is  $\frac{1}{2}$  the area of triangle II. If

$BC \parallel AD$  and the sum of the lengths of  $BC$  and  $AD$  is 18, what is the length of  $AD$ ?