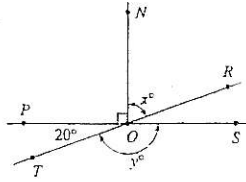
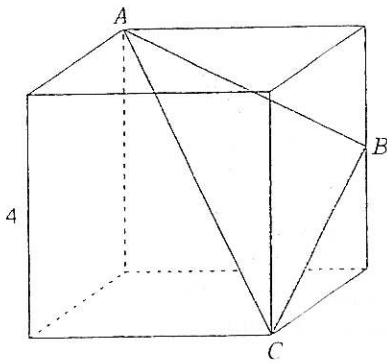
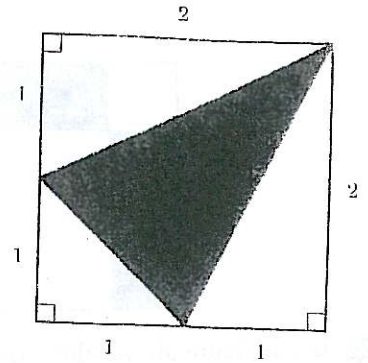


30. The cube in Figure 4 has edges of length 4 cm. If point  $B$  is the midpoint of the edge, what is the perimeter of  $\triangle ABC$ ?



4. In the figure above,  $\overline{PS}$  and  $\overline{TR}$  intersect at  $O$  and  $\overline{ON}$  is perpendicular to  $\overline{PS}$ . What is the value of  $y - x$ ?

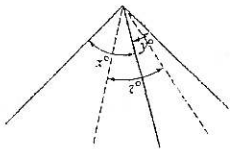


45. 9. If  $\angle A$  is four times  $\angle B$ , and the complement of  $\angle B$  is four times the complement of  $\angle A$ , then  $\angle B =$

6. Suppose  $ABC$  is a triangle such that  $AB = 13$ ,  $BC = 15$ , and  $CA = 14$ . Say  $D$  is the midpoint of  $\overline{BC}$ ,  $E$  is the midpoint of  $\overline{AD}$ ,  $F$  is the midpoint of  $\overline{BE}$ , and  $G$  is the midpoint of  $\overline{DF}$ . Compute the area of triangle  $EFG$ .

2. [2] Rectangle  $ABCD$  has side lengths  $AB = 12$  and  $BC = 5$ . Let  $P$  and  $Q$  denote the midpoints of segments  $AB$  and  $DP$ , respectively. Determine the area of triangle  $CDQ$ .

- 98 29. A point  $(x, y)$  in the plane is called a *lattice point* if both  $x$  and  $y$  are integers. The area of the largest square that contains exactly three lattice points in its interior is closest to



Note: Figure not drawn to scale.

3. In the figure above, if  $x = 70$  and  $y = 40$  and the dotted lines bisect the angles with measures  $x^\circ$  and  $y^\circ$ , what is the value of  $z$ ?

15.  $X$ ,  $Y$ , and  $Z$  are points on a line in that order.  $XY$  is 20, and  $YZ$  is 15 more than  $XY$ . What is  $XZ$ ?

45. The point  $(5, -10)$  is at a distance of 26 from point  $Q$ , and the point  $(2, -10)$  is at a distance of 25 from  $Q$ . Which of the following could be the coordinates of  $Q$ ?

- A.  $(-5, 14)$  B.  $(-3, 18)$  C.  $(-1, 19)$  D.  $(0, 21)$   
E.  $(2, 16)$

25. In Figure 6, what is the area of the shaded region?

121. If the area of a rectangle is 12, what is its perimeter?

- (A) 7  
(B) 8  
(C) 14  
(D) 16

- (E) It cannot be determined from the information given.

33. A CIRCLE AND A SQUARE HAVE THE SAME PERIMETER, SO:

- A. Their AREAS ARE EQUAL  
B. Area of CIRCLE IS GREATER  
C. Area of Square is GREATER  
D. Area of CIRCLE IS  $\pi$  TIMES AREA OF SQUARE  
E. NONE OF ABOVE