

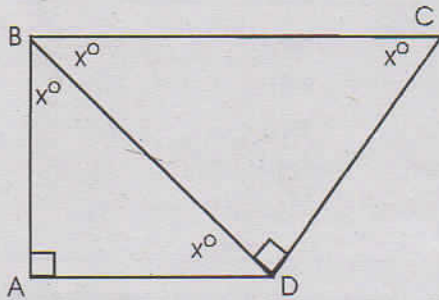
Exercise 1

Column A

Column B

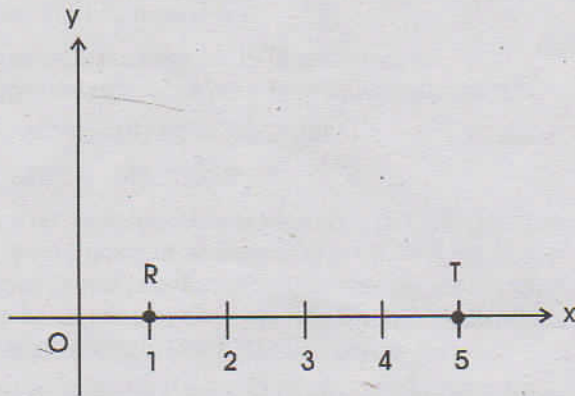
1. Coins are put into 5 pockets so that each pocket contains at least one coin, but no two pockets contain the same number of coins.

The least possible total 16



$AB = 1$

2. The perimeter of quadrilateral $ABCD$ 6
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3. Point S (not shown) lies above the x-axis such that ΔRST has area equal to 6.

The x-coordinate of point S The y-coordinate of point S

4. For all integers x and y , let $x * y$, be defined as follows.

$$x * y = -|x + y|$$

$3 * (-4)$ $3 - 4$

The average (arithmetic mean) of 12 and 20 is equal to the average (arithmetic mean) of 15 and x .

5. x 16
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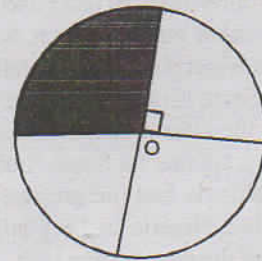
The total surface area of cube C equals 150.

6. The length of one edge of cube C 4.5
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7. $x + 32y$ $32x + y$
-

8. $x = 1 - y$

$x^2 + 2xy + y^2$ $x + y$



The circle has center O and radius 1.

9. The area of the shaded region $\pi/2$
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10. $y > 0, y \neq 1$

\sqrt{y} y^2

11. The length of two sides of isosceles ΔABC are 9 and 15. The perimeter of ΔABC 33
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12. Distance from the center of a circle to a chord is 5 and the length of the chord is 24

Radius of the circle 13

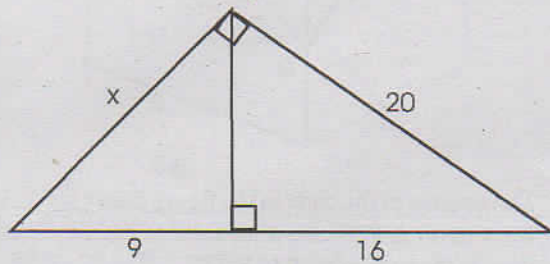
13. A locksmith has n keys that open a total of n locks. Each key opens exactly one lock. It takes 15 seconds to determine whether a given key opens a given lock. If

after a total of 3 minutes spent exclusively on determining whether or not the first k of the n keys fit a given lock, 40 percent of the keys have been tried, then $n =$

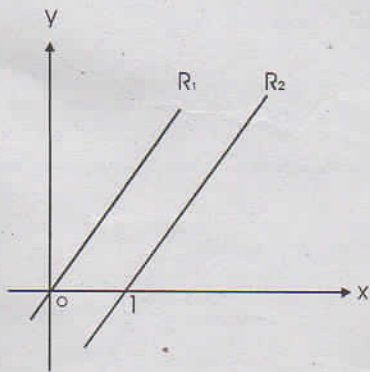
- (A) 12 (B) 16 (C) 18 (D) 20 (E) 30

14. The illumination E , in footcandles, provided by a light source of intensity L , in candles, at a distance D , in feet, is given by $E = L/D^2$. For an illumination of 50 footcandles at a distance of 4 feet from a source, the intensity of the source must be

- (A) 50 candles (B) 200 candles (C) 800 candles
(D) 1,600 candles (E) 2,500 candles



15. What is the value of x in the figure above?
(A) 12 (B) 12.5 (C) 15 (D) $9\sqrt{3}$ (E) 18
16. If $3x + 1$ represents an odd integer, which of the following represents the next larger odd integer?
(A) $3(x + 1)$ (B) $3(x + 2)$ (C) $3(x + 3)$
(D) $3x + 2$ (E) $3(x + 2) + 1$



17. In the rectangular coordinate system above, if the equation of R_1 is $y = x$, and $R_1 \parallel R_2$, what is the shortest distance between R_1 and R_2 ?
(A) $\sqrt{2}$ (B) 1 (C) $\sqrt{2}/2$ (D) $1/2$ (E) $1/4$

18. If 10 machines can manufacture 36 TVs in 18 minutes, how much time (in minutes) 30 machines take to manufacture 132 TVs?
(A) 5 (B) 10 (C) 11 (D) 22 (E) 30

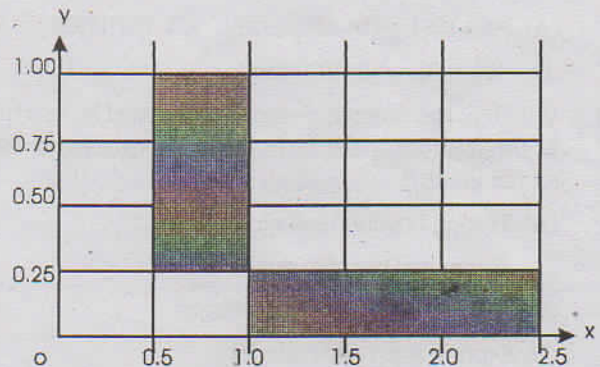
19. In a class of 120 students, 60 percent can speak French and the rest can speak only English. If 25 percent of those in the class who can speak French can also speak English, how many of the students in the class can speak English?

- (A) 54 (B) 60 (C) 66 (D) 84 (E) 90

20. The charge for a telephone call made at 10:00 a.m. from City Y to City X is \$0.50 for the first minute and \$0.34 for each additional minute. At these rates, what is the difference between the total cost of three 5-minute calls and the cost of one 15-minute call?

- (A) \$0.00 (B) \$0.16
(C) \$0.32 (D) \$0.48
(E) \$1.00

21. The list price of a watch costing \$450 is \$700. If it was sold at successive discounts of 10% and $d\%$, the net profit is \$54. If instead of offering successive discounts a single discount of $1.5d\%$ is offered, the profit would be
(A) \$40 (B) \$70 (C) \$100 (D) \$60 (E) \$8.10

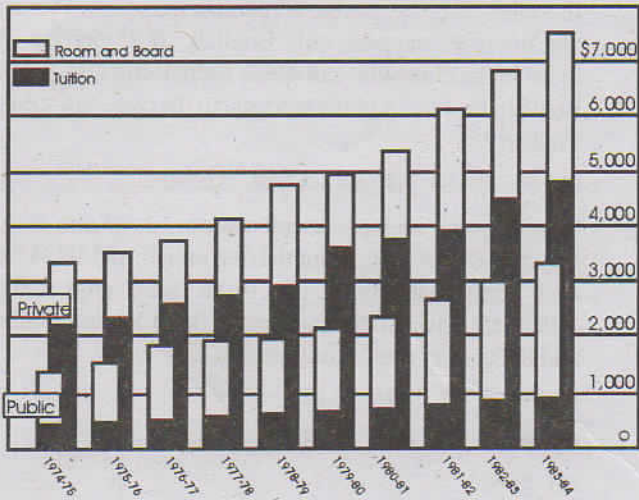


22. What is the sum of the areas of the shaded rectangular regions shown in the figure above?
(A) 3.0 (B) 2.5 (C) 1.5 (D) 1.125 (E) 0.75

Questions 23 - 27

Refer to the following graph. In these questions, all references to charges should be interpreted as the average annual charges shown on the graph.

AVERAGE ANNUAL TOTAL CHARGES * FOR UNDERGRADUATE TUITION, ROOM, AND BOARD AT AMERICAN COLLEGES, 1974 - 1984.

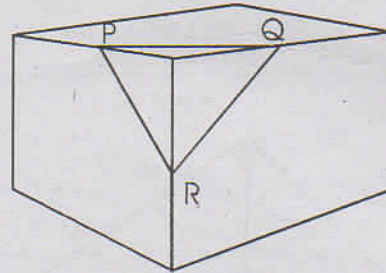


* The total charge consists of room, board and tuition.

Note: Drawn to scale

23. In which school year shown was the total charge for undergraduate tuition, room, and board at public colleges most nearly equal to \$3,000 ?
(A) 1983-1984 (B) 1982-1983 (C) 1981-1982
(D) 1980-1981 (E) 1979-1980
24. Which of the following charges increased by less than \$1,000 from the first to the last of the ten years represented on the graph ?
(A) Tuition at public colleges
(B) Room and board at public colleges
(C) Total charge at public colleges
(D) Tuition at private colleges
(E) Total charge at private colleges
25. For how many of the school years shown was the total charge at private colleges at least \$3,000 more than the total charge at public colleges ?
(A) Two (B) Three (C) Four
(D) Five (E) Six
26. In the 1978-1979 school year, the ratio of the total charge at private colleges to the total charge at public colleges was closest to
(A) 5/3 (B) 9/5 (C) 2/1 (D) 9/4 (E) 3/1

27. For the school year 1981-82 in which the charge for room and board at public colleges was most nearly equal to \$2,000, what was the approximate charge for tuition at private colleges?
(A) \$750 (B) \$3,500
(C) \$3,900 (D) \$4,500 (E) \$4,900



28. The volume of the cube in the figure above is 64. If the vertices of $\triangle PQR$ are midpoints of the cube's edges, what is the perimeter of $\triangle PQR$?
(A) 6 (B) $6\sqrt{2}$ (C) $6\sqrt{3}$ (D) 12 (E) $12\sqrt{2}$

STOP