Multiple-Choice
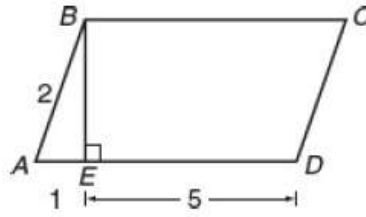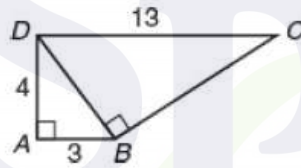

1. In the figure above, what is the area of parallelogram *ABCD*?

    (A) $4\sqrt{2}$
    (B) $4\sqrt{3}$
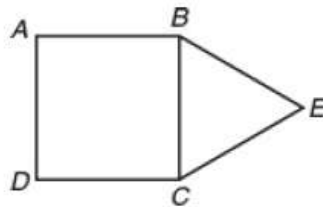   (C) $6\sqrt{2}$
    (D) $6\sqrt{3}$

2. What is the area of a square with a diagonal of $\sqrt{2}$?

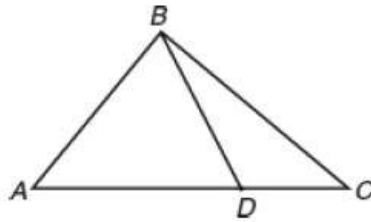   (A) $\frac{1}{2}$

    (B) 1
    (C) $\sqrt{2}$
    (D) 2

3. In the figure above, what is the area of quadrilateral *ABCD?*
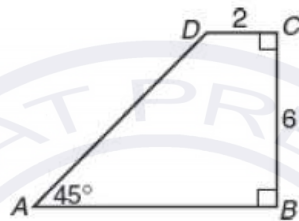
    (A) 28
    (B) 32
    (C) 36
    (D) 42

4. In the figure above, if the area of square *ABCD* is 64, what is the area of equilateral triangle *BEC*?

    (A) 8
    (B) $8\sqrt{3}$
    (C) $12\sqrt{3}$
    (D) $16\sqrt{3}$
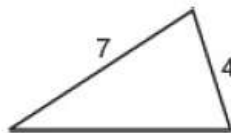
5. In the figure above, the ratio of *AD* to *DC* is 3 to 2. If the area of △*ABC* is 40, what is the area of △ *BDC*?

   (A) 16
   (B) 24
   (C) 30
   (D) 36

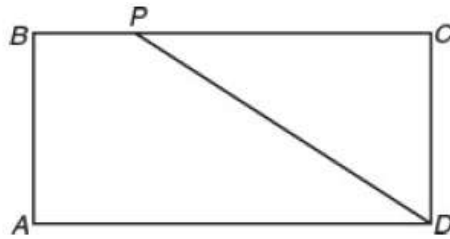**Questions 6–7** are based on the diagram below.

Note: Figure not drawn to scale.

6. What is the perimeter of quadrilateral *ABCD*?

   (A) $16 + 2\sqrt{2}$
   (B) $16 + 6\sqrt{2}$
   (C) 28
   (D) $22 + 6\sqrt{2}$

7. What is the area of quadrilateral *ABCD*?
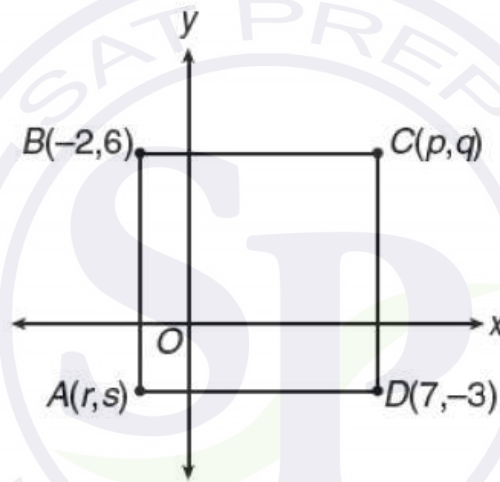
   (A) 20
   (B) 24
   (C) 30
   (D) 36

8. If the perimeter of the triangle above is 18, what is the area of the triangle?

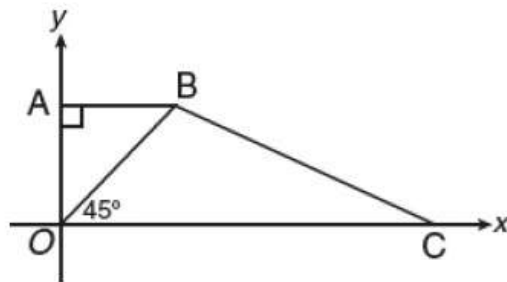   (A) $2\sqrt{33}$
   (B) $6\sqrt{5}$
   (C) 14
   (D) $9\sqrt{5}$

9. In rectangle ABCD, point P divides BC such that BP is 25% of the length of BC. If the area of quadrilateral ABPD is $\frac{3}{4}$, what is the area of rectangle ABCD?

(A) $\frac{15}{6}$

(B) $\frac{9}{8}$

(C) $\frac{6}{5}$

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

10. In the figure above, what is an equation of the line that contains diagonal AC of square ABCD?

(A) $y = 2x + 1$

(B) $y = \frac{1}{2}x - 2$

(C) $y = 2x - 8$

(D) $y = x - 1$

11. In the figure above, $\overline{OA} \perp \overline{AB}$, and $m\angle BOC = 45°$. If the coordinates of point A are (0, 3) and the coordinates of point C are (7, 0), what is the number of square units in the area of quadrilateral OABC?

(A) 15

(B) 20
(C) 25
(D) 30

12. If one pair of opposite sides of a square are increased in length by 20% and the other pair of sides are increased in length by 50%, by what percent is the area of the rectangle that results greater than the area of the original square?
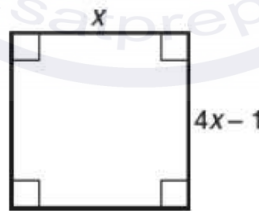
(A) 80%
(B) 77%
(C) 75%
(D) 70%
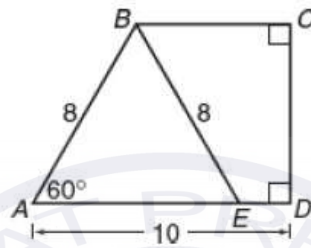
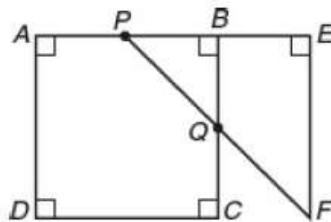13. In the figure above, what is the area of quadrilateral BCDE?

(A) $8\sqrt{3}$
(B) $16\sqrt{3}$
(C) $8 + 4\sqrt{3}$
(D) $4 + 12\sqrt{3}$

Grid-In

1. Brand X paint costs $14 per gallon, and 1 gallon provides coverage of an area of at most 150 square feet. What is the minimum cost of the amount of brand X paint needed to cover the four walls of a rectangular room that is 12 feet wide, 16 feet long, and 8 feet high?
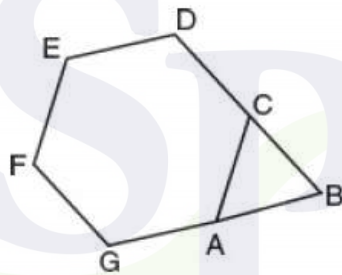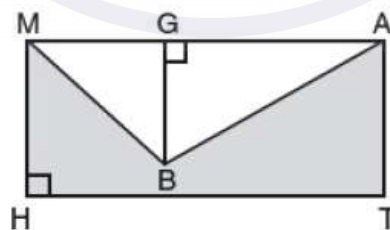

2. What is the area of the square above?

3. In the figure above, P and Q are the midpoints of sides AB and BC, respectively, of square ABCD. Line segment PB is extended by its own length to point E, and line segment PQ is extended to point F so that $FE \perp PE$. If the area of square ABCD is 9, what is the area of quadrilateral QBEF?
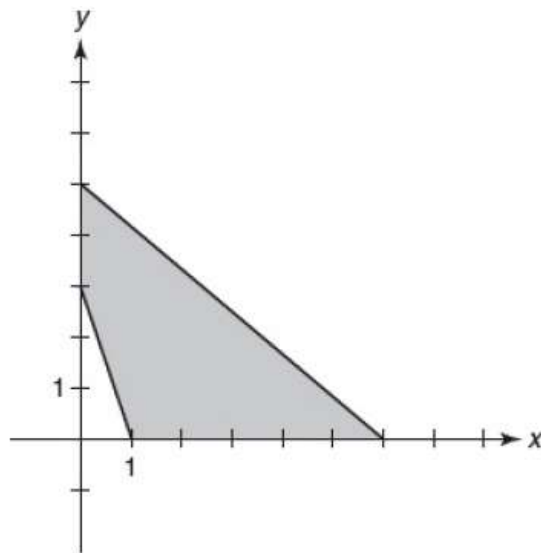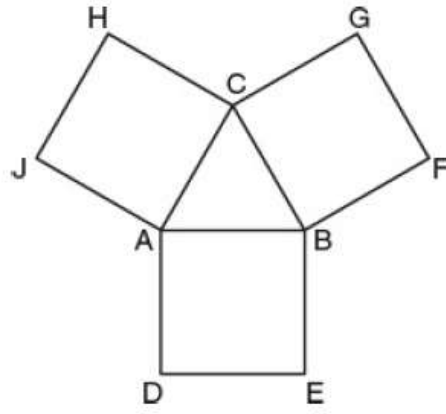
4. In the figure above, what is the number of square units in the area of the shaded region?

5. If the coordinates of the endpoints of a diagonal of a square are (−2, −3) and (5, 4), what is the number of square units in the area of the square?

6. What is the number of square units in the area of the region in the first quadrant of the xy-plane that is bounded by y = |x| + 2, the line x = 5, the positive x-axis, and the positive y-axis?

7. In the figure above, ACDEFG is a regular hexagon. Sides DC and GA are extended such that A is the midpoint of $\overline{BG}$ and C is the midpoint of $\overline{BD}$. If the area of △ABC is $9\sqrt{3}$ square centimeters, what is the number of centimeters in the perimeter of polygon ABCDEFG?

8. In the figure, MATH is a rectangle, GB = 4.8, MH = 6, and HT = 15. The area of the shaded region is how many times larger than the area of △MBA?

9. In the figure above, quadrilaterals *ABED*, *BFGC*, and *ACHJ* are squares. If the area of equilateral △ *ABC* is $16\sqrt{3}$ square inches, what is the number of inches in the perimeter of polygon *ADEBFGCHJA*?