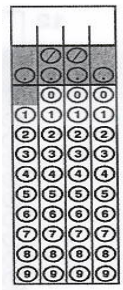
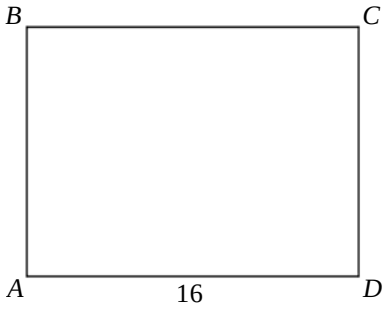
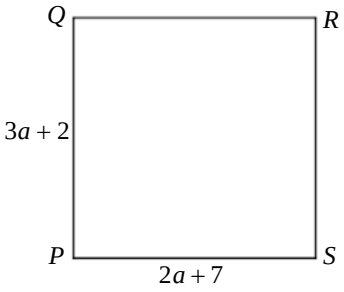
UB SAT 2009
Worksheet #22
Quadrilaterals

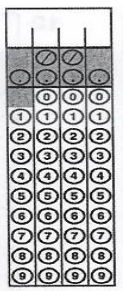




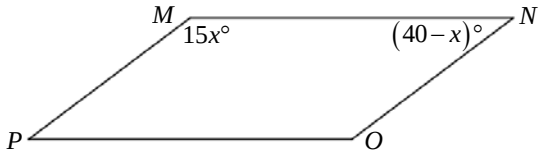
1. In the figure above, if the perimeter of rectangle *ABCD* is 56, and if the length of $AD = 16$, what is the area of *ABCD*?



2. In the figure above, if *PQRS* is a square, what is the value of *a*?
   (A) $\frac{9}{5}$
   (B) $\frac{9}{2}$
   (C) 5
   (D) 7
   (E) 9



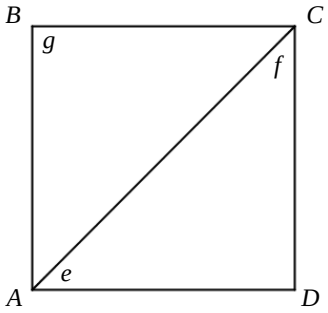
3. The area of a certain rectangle is 36. If the ratio of the length of the rectangle to the width of the rectangle is 4 to 1, what is the perimeter of the rectangle?



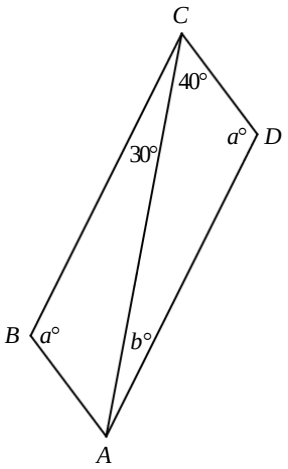
4. In the figure above, *MNOP* is a parallelogram. What is the value of *x*?
   (A) 20
   (B) 10
   (C) 5
   (D) $\frac{25}{7}$
   (E) $\frac{5}{2}$

5. In quadrilateral *DEFG*, the degree measures of its 4 angles are in the ratio of 2:3:5:6. What is the difference in the degree measure between the largest and smallest angles?
   (A) 135
   (B) 112.5
   (C) 90
   (D) 67.5
   (E) 45

6. The figure above is a parallelogram. What is the value of *y*?
   (A) 50
   (B) 55
   (C) 60
   (D) 65
   (E) 70

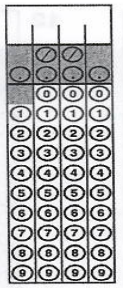


7. In square *ABCD*, what is the average (arithmetic mean) of angles *e*, *f*, and *g*?
   (A) 45
   (B) 60
   (C) 90
   (D) 100
   (E) 180

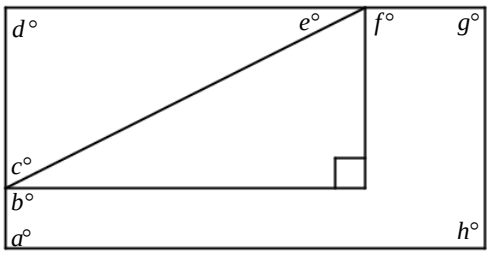


Note: figure not drawn to scale.

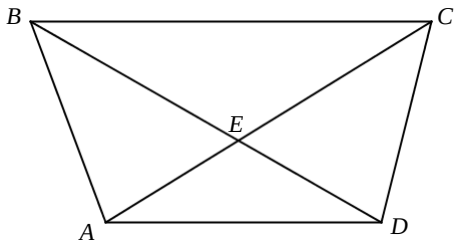
8. In parallelogram *ABCD* above, what is the value of $2a + b$?
   (A) 120
   (B) 180
   (C) 240
   (D) 250
   (E) 320



9. If the length of a rectangle is one-third the perimeter of the rectangle, then the width of the rectangle is what fraction of the perimeter?

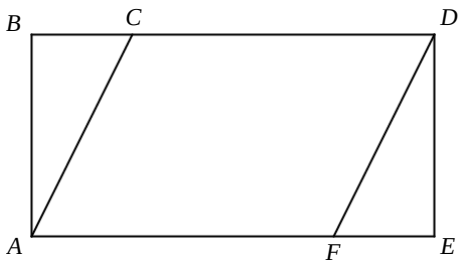


10. In the figure above, what is the sum of *a*, *b*, *c*, *d*, *e*, *f*, *g*, and *h*?
    (A) 100
    (B) 180
    (C) 360
    (D) 500
    (E) 630



Note: figure not drawn to scale.

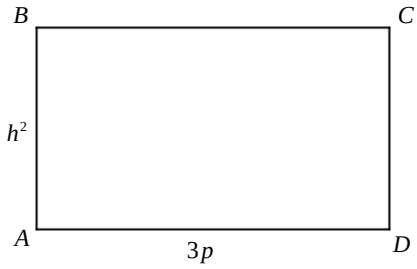
11. In the figure above, $\overline{AC}$ and $\overline{BD}$ intersect at point *E*. If $m\angle ABC = 80°$, $m\angle BCE = 50°$, and $m\angle CEB = \frac{3}{4} m\angle ABC$, what fraction of $m\angle CEB$ is $\angle BAC$?
    (A) $\frac{1}{7}$
    (B) $\frac{4}{7}$
    (C) $\frac{2}{3}$
    (D) $\frac{5}{7}$
    (E) $\frac{5}{6}$



Note: figure not drawn to scale.

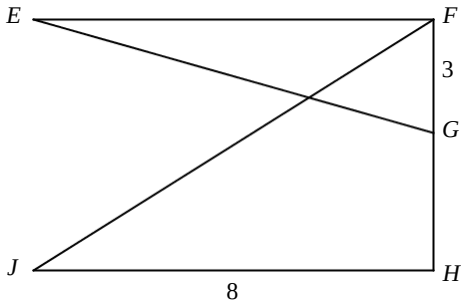
12. In the figure above, $ABDE$ is a rectangle. The length of $\overline{BD}$ is 13, the length of $\overline{CD}$ is 5, and the length of $\overline{AC}$ is 10. What is the area of parallelogram $ACDF$?
    (A) 24
    (B) 30
    (C) 50
    (D) 60
    (E) 78

13. In a square with vertices $WXYZ$, if point V is the midpoint of side YZ and the area of the triangle XYV is $\frac{4}{5}$, what is the area of square $WXYZ$?
    (A) 2
    (B) $\frac{8}{5}$
    (C) 4
    (D) $\frac{16}{5}$
    (E) $\frac{18}{5}$



Note: figure not drawn to scale.

14. What happens to the area of rectangle $ABCD$ above if h is doubled and side p is halved?
    (A) The area is squared.
    (B) The area is multiplied by 4.
    (C) The area is doubled.
    (D) The area is halved.
    (E) The area remains the same.



Note: figure not drawn to scale.

15. In the figure above, G is the midpoint of $\overline{FH}$ and $\overline{EF} \perp \overline{FH}$. If $\angle EGF \cong \angle JFH$ and $\angle FJH \cong \angle FEG$, what is the perimeter of ΔEFG?
    (A) 12
    (B) $6\sqrt{8}$
    (C) $11+\sqrt{73}$
    (D) 24
    (E) 48

16. ΔABC is equilateral and has an area of $1\frac{3}{5}$. Point D is the midpoint of side AB, point E is the midpoint of side BC, and point F is the midpoint of side AC. What is the area of parallelogram $DECF$?

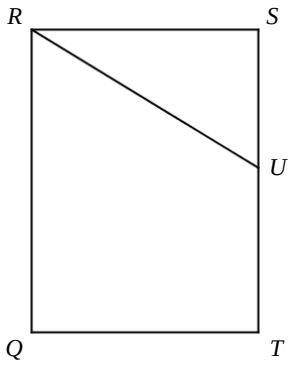
(A) $\frac{2}{5}$

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

(C) $\frac{4}{5}$

(D) $\frac{13}{15}$

(E) 1



17. In rectangle $QRST$ shown above, if $m\angle SUR$ is $\frac{4}{5}$ of $m\angle SRU$, what is the sum of the measures of $\angle RUT$ and $\angle RQT$?

(A) 230°

(B) 245°

(C) 260°

(D) 275°

(E) 290°

18. Quadrilateral $ABCD$ has a perimeter of 26 and sides of integer lengths. If $AB = m$, and $BC = CD = DA = n$, when what is the difference between the greatest and least possible values of n?

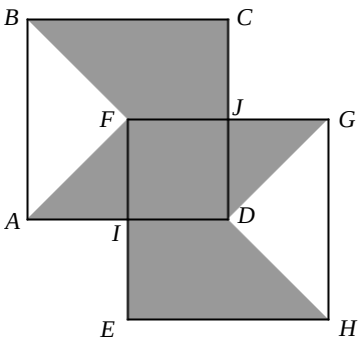
(A) 7

(B) 6

(C) 5

(D) 4

(E) 3



19. In the figure above, two identical squares $ABCD$ and $EFGH$ overlap. I is the midpoint of $\overline{AD}$ and $\overline{EF}$. J is the midpoint of $\overline{CD}$ and $\overline{FG}$. If square $ABCD$ has an area of 64, what is the area of the shaded region?

(A) 128

(B) 118

(C) 104

(D) 96

(E) 80

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Answers

1. 12
2. C
3. 30
4. B
5. C
6. E
7. B
8. D
9. $\frac{1}{6}$
10. E
11. E
12. B
13. D
14. C
15. A
16. C
17. A
18. A
19. E