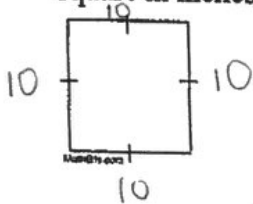


# Numerical Practice with Quadrilaterals

Name \_\_\_\_\_

Directions: Read carefully.

1. The area of a square is 100 square inches. What is the perimeter of the square in inches?

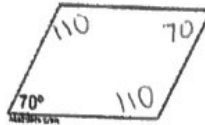


$$A = L \times W$$

$$A = (10)(10) = 100$$

$$4(10) = 40 \text{ in}^2$$

2. If one angle of a parallelogram is  $70^\circ$ , find the degrees in the remaining three angles.



ANSWERS

1. 40

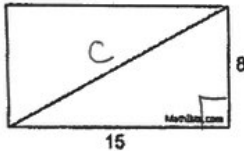
2. 70

110

110

3. 17

3. The length and width of a rectangle are 15 cm. and 8 cm. What is the length of the diagonal in centimeters?



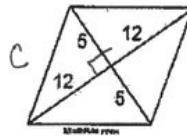
$$15^2 + 8^2 = c^2$$

$$225 + 64 = c^2$$

$$\sqrt{289} = \sqrt{c^2}$$

$$17 = c$$

4. The diagonals of a rhombus are 10 units and 24 units. Find the perimeter of the rhombus.



$$5^2 + 12^2 = c^2$$

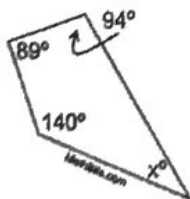
$$25 + 144 = c^2$$

$$\sqrt{169} = \sqrt{c^2} \quad 13(4) = 52$$

$$13 = c$$

4. 52

5. Three angles of a quadrilateral measure  $89^\circ$ ,  $94^\circ$ , and  $140^\circ$ . What is the measure of the fourth angle?

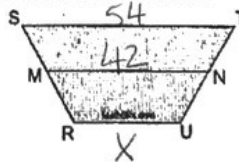


$$89 + 94 + 140 + x = 360$$

$$323 + x = 360$$

$$x = 37$$

6.  $MN$  is the median of trapezoid  $RSTU$ .  $MN = 42$  inches and  $ST = 54$  inches. Find  $RU$  in inches.



$$2 \cdot 42 = \frac{1}{2} (54 + x) \cdot 2$$

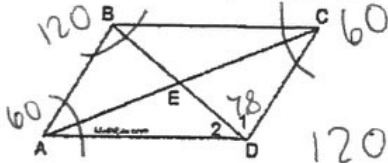
$$84 = 54 + x$$

$$30 = x$$

5. 37

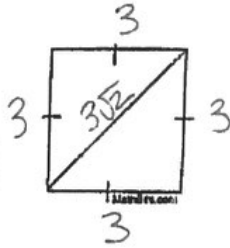
6. 30

7. Given parallelogram  $ABCD$  with diagonals  $\overline{AC}$ ,  $\overline{BD}$ . If  $m\angle 1 = 78^\circ$  and  $m\angle BAD = 60^\circ$ , find  $m\angle 2$ .



$$120 - 78 = 42$$

8. What is the perimeter of a square whose diagonal is  $3\sqrt{2}$ ?



$$3(4) = 12$$

ANSWERS

7. 42

8. 12

9. 16

10. 53

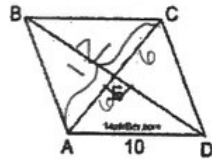
11. 150

12. 110

13. 157.5

14. 22

9. Given rhombus  $ABCD$  with diagonals  $\overline{AC}$ ,  $\overline{BD}$ . If  $AD = 10$ , and  $AC = 12$ , what is  $BD$ ?



$$6^2 + b^2 = 10^2$$

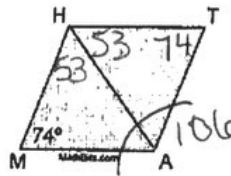
$$36 + b^2 = 100$$

$$\sqrt{b^2} = \sqrt{64}$$

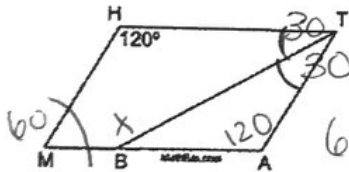
$$b = 8$$

$$8 + 8 = 16$$

10. Given rhombus  $MATH$  with  $m\angle M = 74^\circ$ . What is  $m\angle MHA$ ?



11. Given parallelogram  $MATH$  with  $\overline{BT}$  bisecting  $\angle HTA$ . Find  $m\angle MBT$ .



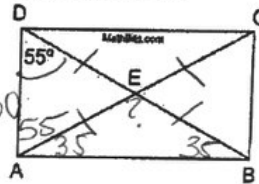
$$60 + 30 + 120 + x = 360$$

$$210 + x = 360$$

$$x = 150$$

12. Given rectangle  $ABCD$ ,  $m\angle ADB = 55^\circ$  and diagonals  $\overline{AC}$  and  $\overline{BD}$ .

Find  $m\angle AEB$ .

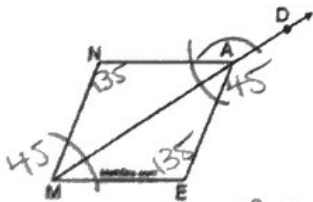


$$35 + 35 + x = 180$$

$$70 + x = 180$$

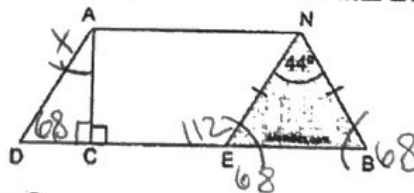
$$x = 110$$

13. Given rhombus  $MEAN$  with diagonal  $\overline{MA}$  extended through point  $D$ , and  $m\angle E = 135^\circ$ . Find  $m\angle DAN$ ?



$$180 - 22.5 = 157.5$$

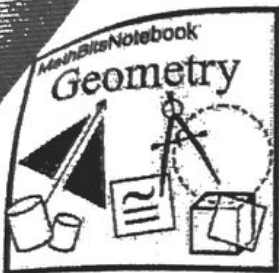
14. Given parallelogram  $DANE$  and isosceles  $\triangle BEN$ .  $m\angle ENB = 44^\circ$  and  $\overline{AC}$  is an altitude. Find  $m\angle DAC$ .



$$68 + 90 + x = 180$$

$$158 + x = 180$$

$$x = 22$$

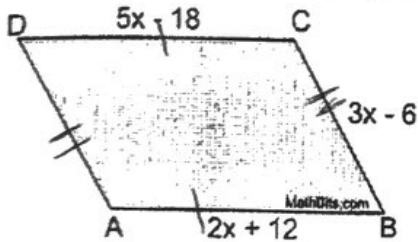


# Algebraic Practice with Quadrilaterals

Name \_\_\_\_\_

Directions: Read carefully. Show your work.

1. The sides of parallelogram  $ABCD$  are represented as shown. Find  $DA$ .



$$5x - 18 = 2x + 12$$

$$3x = 30$$

$$x = 10$$

$$3(10) - 6 = \boxed{24}$$

3. The perimeter of quadrilateral  $ABCD$  is 46 inches.  $AB = x + 8$ ,  $BC = 2x + 1$ ,  $CD = 3x - 6$ , and  $DA = 4x - 7$ . Find the length of the shortest side of the quadrilateral.

$$x + 8 + 2x + 1 + 3x - 6 + 4x - 7 = 46$$

$$10x - 4 = 46$$

$$10x = 50$$

$$x = 5$$

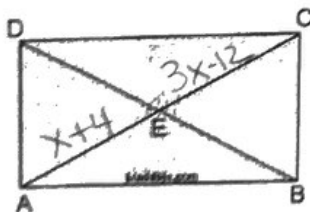
$$AB = 13$$

$$BC = 11$$

$$CD = 9$$

$$DA = 13$$

5. The diagonals of rectangle  $ABCD$  intersect at  $E$ .  $AE = x + 4$  and  $CE = 3x - 12$ . Find  $BD$ .



\*diagonals  
 $\cong$

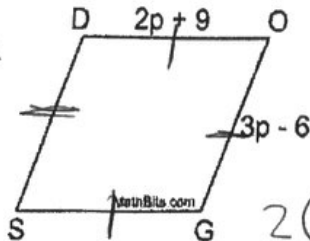
$$x + 4 = 3x - 12$$

$$16 = 2x$$

$$8 = x$$

$$\left. \begin{array}{l} AE = 12 \\ EC = 12 \end{array} \right\} BD = 24$$

2. In rhombus  $DOGS$ ,  $DO = 2p + 9$  and  $OG = 3p - 6$ . Find  $GS$ .

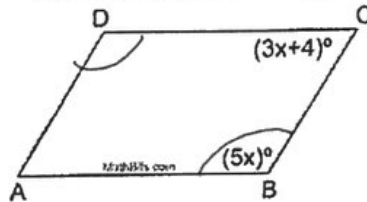


$$2p + 9 = 3p - 6$$

$$15 = p$$

$$2(15) + 9 = \boxed{39}$$

4. Given parallelogram  $ABCD$  with  $m\angle B = 5x$  and  $m\angle C = 3x + 4$ . Find the number of degrees in  $\angle D$ .



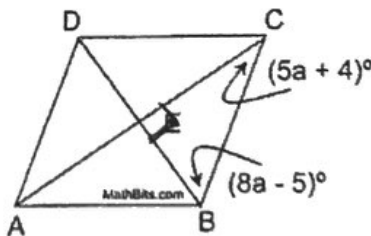
$$5(22) = \boxed{110}$$

$$3x + 4 + 5x = 180$$

$$8x + 4 = 180$$

$$x = 22$$

6. In rhombus  $ABCD$ ,  $m\angle ECB = 5a + 4$  and  $m\angle EBC = 8a - 5$ . Find  $m\angle EBC$ .



$$5a + 4 + 8a - 5 + 90 = 180$$

$$13a + 89 = 180$$

$$13a = 91$$

$$a = 7$$

$$m\angle EBC = 8(7) - 5 = \boxed{51}$$

ANSWERS

1. 24

2. 39

3. 9

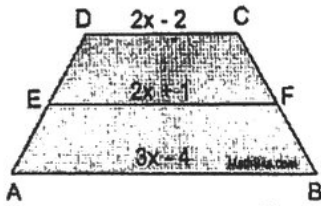
4. 110

5. 24

6. 51

midsegment

7. Given trapezoid  $ABCD$  with median  $\overline{EF}$  (labeled as shown). Find  $EF$ .



$$2x + 1 = \frac{1}{2}(2x - 2 + 3x - 4)$$

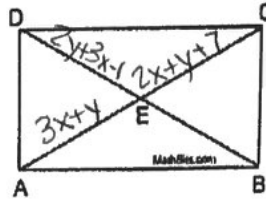
$$2 \cdot (2x + 1) = \frac{1}{2}(5x - 6) \cdot 2$$

$$4x + 2 = 5x - 6$$

$$8 = x$$

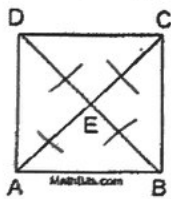
$$EF = 2(8) + 1 = 17$$

8. In rectangle  $ABCD$ ,  $AE = 3x + y$ ,  $EC = 2x + y + 7$  and  $DE = 2y + 3x - 1$ . Find the values of  $x$  and  $y$ .



ANSWERS  
7. 17  
8. x=7  
y=1

9. Given square  $ABCD$  with diagonals  $\overline{AC}$ ,  $\overline{BD}$ . If  $DB = 7x + 1$  and  $AE = 2x + 11$ , find  $EB$ .



$$2(2x + 11) = 7x + 1$$

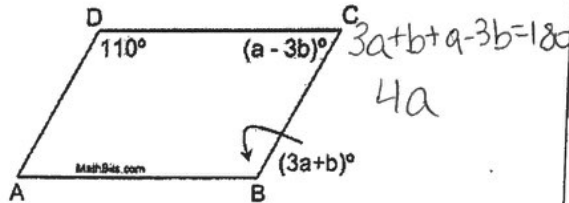
$$4x + 22 = 7x + 1$$

$$21 = 3x$$

$$7 = x$$

$$AE = EB = 2(7) + 11 = 25$$

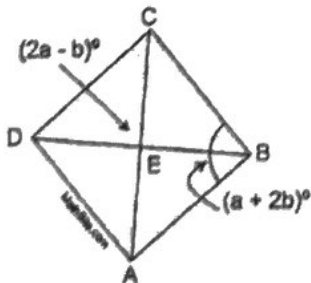
10. Given parallelogram  $ABCD$ , labeled as shown. Find  $a$  and  $b$ .



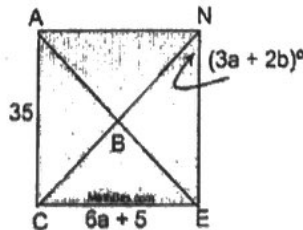
$$3a + b = 110$$

9. 25  
10. a=40  
b=-10

11. Given square  $ABCD$  with diagonals  $\overline{AC}$ ,  $\overline{BD}$ . The  $m\angle DEC = 2a + b$  and  $m\angle ABC = a + 2b$ . Find  $a$  and  $b$ .



12. Given square  $CANE$  with diagonals intersecting at  $B$ .  $AC = 35$ ,  $CE = 6a + 5$ , and  $m\angle CNE = 3a + 2b$ . Find the value of  $a + b$ .



11. a=54  
b=18  
12. 20