

# Chapter 6 Practice

SCORE \_\_\_\_\_

1. What is the sum of the interior angles of an octagonal box?

$$\begin{aligned} (n-2) \cdot 180 \\ (8-2) \cdot 180 \end{aligned}$$

1. 1080°

2. A convex pentagon has interior angles with measures  $(5x - 12)^\circ$ ,  $(2x + 100)^\circ$ ,  $(4x + 16)^\circ$ ,  $(6x + 15)^\circ$ , and  $(3x + 41)^\circ$ . Find the value of  $x$ .

$$\begin{aligned} \text{sum} &= 540 \\ 20x + 160 &= 540 \\ 20x &= 380 \end{aligned}$$

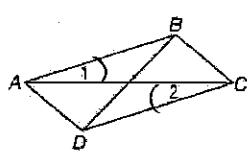
2.  $x = 19$

3. If the measure of each interior angle of a regular polygon is 171, find the number of sides in the polygon.

$$(n-2) \cdot 180 = 171n$$

3. 40 sides

4. In parallelogram  $ABCD$ ,  $m\angle 1 = x + 12$ , and  $m\angle 2 = 6x - 18$ . Find  $m\angle 1$ .



$$\begin{aligned} 180n - 360 &= 171n \\ -180n & \quad -180n \\ -360 &= -9n \end{aligned}$$

4. 18°

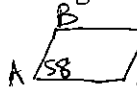
$$\begin{aligned} x + 12 &= 6x - 18 \\ 30 &= 5x \\ x &= 6 \end{aligned}$$

5. Find the measure of each exterior angle of a regular 45-gon.

$$\frac{360 - \text{sum}}{45}$$

5. 8°

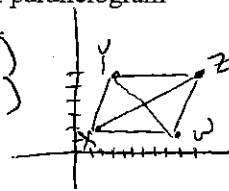
6. In parallelogram  $ABCD$ ,  $m\angle A = 58$ . Find  $m\angle B$ .



$$180 - 58$$

6. 122°

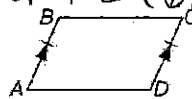
7. Find the coordinates of the intersection of the diagonals of parallelogram  $XYZW$  with vertices  $X(2, 2)$ ,  $Y(3, 6)$ ,  $Z(10, 6)$ , and  $W(9, 2)$ .



midpoint of  $YW$   $(6, 4)$   
midpoint of  $XZ$   $(6, 4)$

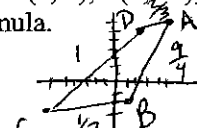
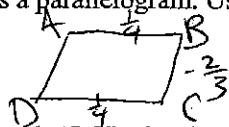
7.  $(6, 4)$

8. Determine whether  $ABCD$  is a parallelogram. Justify your answer.



8. yes - 1 pair of sides is both  $\parallel$  +  $\cong$

9. Determine whether the quadrilateral with vertices  $A(5, 7)$ ,  $B(1, -2)$ ,  $C(-6, -3)$ , and  $D(2, 5)$  is a parallelogram. Use the slope formula.



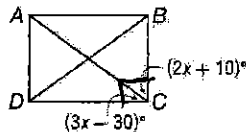
9. no - opposite slopes are not the same - opp. sides not  $\parallel$

10. For quadrilateral  $ABCD$ , the slope of  $\overline{AB}$  is  $\frac{1}{4}$ , the slope of  $\overline{BC}$  is  $-\frac{2}{3}$ , and the slope of  $\overline{CD}$  is  $\frac{1}{4}$ . Find the slope of  $\overline{DA}$  so that  $ABCD$  will be a parallelogram.

10.  $-\frac{2}{3}$

11. Given rectangle  $ABCD$ , find the value of  $x$ .

$$\begin{aligned} 3x - 30 + 2x + 10 &= 90 \\ 5x - 20 &= 90 \\ 5x &= 110 \\ x &= 22 \end{aligned}$$



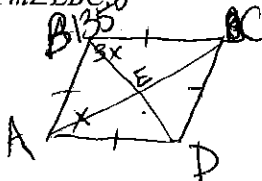
11. 22

12.  $ABCD$  is a parallelogram and  $AC \cong BD$ . Determine whether  $ABCD$  is a rectangle. Justify your answer.



12. yes - diagonals are congruent

13.  $ABCD$  is a rhombus with diagonals intersecting at  $E$ . If  $m\angle ABC$  is three times  $m\angle BAD$ , find  $m\angle EBC$ .



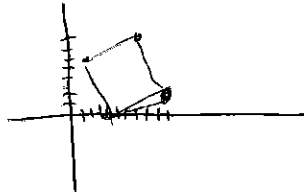
$$\begin{aligned} 3x + x &= 180 \\ 4x &= 180 \\ x &= 45 \end{aligned}$$

13. 67.5°

$$\frac{135}{2}$$

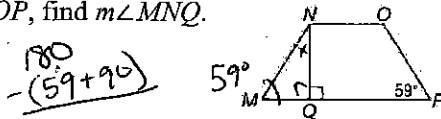
# Chapter 6 Practice Test

14.  $TUVW$  is a square with  $U(10, 2)$ ,  $V(8, 8)$ , and  $W(2, 6)$ . Find the coordinates of  $T$ .



14. (4, 0)

15. For isosceles trapezoid  $MNOP$ , find  $m\angle MNQ$ .



15. 31°

16.  $ABCD$  is a quadrilateral with vertices  $A(8, 3)$ ,  $B(6, 7)$ ,  $C(-1, 5)$ , and  $D(-6, -1)$ . Determine whether  $ABCD$  is a trapezoid. Justify your answer.

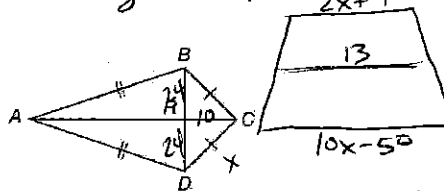
16. yes -  $\overline{BC} \parallel \overline{AD}$

17. The length of the median of trapezoid  $EFGH$  is 13 feet. If the bases have lengths  $2x + 4$  and  $10x - 50$ , find  $x$ .

← average the bases

17. 6

18.  $ABCD$  is a kite. If  $RC = 10$ , and  $BD = 48$ , find  $CD$ .



$$10^2 + 24^2 = x^2$$

$$100 + 576 = x^2$$

$$676 = x^2$$

$$\frac{2x+4+10x-50}{2} = 13$$

$$12x - 46 = 26$$

$$12x = 72$$

18. 26

For Questions 19-25, write *true* or *false*.

19. A rectangle is always a parallelogram.

19. true

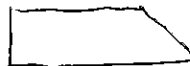
20. The diagonals of a rhombus are always perpendicular.

20. true

21. The diagonals of a square always bisect each other.

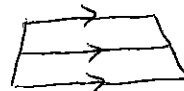
21. true

22. A trapezoid always has two congruent sides.



22. false

23. The median of a trapezoid is always parallel to the bases.



23. true

24. A kite has exactly two congruent angles.



24. true

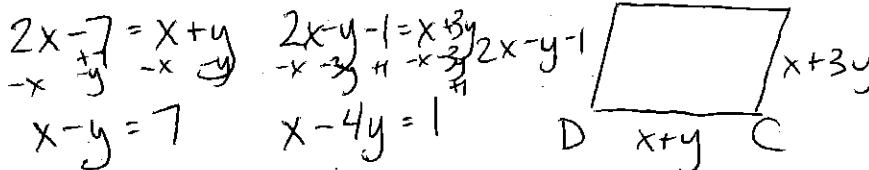
25. If the diagonals of a parallelogram are perpendicular, then the parallelogram is a rectangle.

→ rhombus

25. false

**Bonus** In parallelogram  $ABCD$ ,  $AB = 2x - 7$ ,  $BC = x + 3y$ ,  $CD = x + y$ , and  $AD = 2x - y - 1$ . Find the values of  $x$  and  $y$ .

A  $2x-7$  B



$$2x-7 = x+y$$

$$2x-y-1 = x+3y$$

$$x-y = 7$$

$$x-4y = 1$$

system of equations

B:  $x=9$   $y=2$

$$\begin{array}{r} x-y=7 \\ -(x-4y=1) \quad \text{add} \\ \hline -x+4y=-1 \end{array}$$

$$3y=6$$

$$y=2$$

plug in