

Unit 6 Review: Polygons

SCORE

Write the letter for the correct answer in the blank at the right of each question.

1. Find the sum of the measures of the interior angles of a convex 45-gon.

A 8100

B 7740

C 360

D 172

$$(n-2)180$$

$$(45-2)180 = 43(180) = 7740$$

2. Find the value of
- x
- .

F 30

G 66

H 102

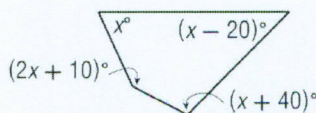
J 138

$$x + x - 20 + x + 40 + 2x + 10 = 360$$

$$5x + 30 = 360$$

$$5x = 330$$

$$x = 66$$



$$4 \text{ Sides: } (n-2)180$$

$$(4-2)180$$

$$(2)180$$

$$360$$

3. Find the sum of the measures of the exterior angles of a convex 39-gon.

A 39

B 90

C 180

D 360

The sum of the measures of the exterior angles of any convex polygon is 360° .

4. Which of the following is a property of a parallelogram?

F Each pair of opposite sides is congruent. ✓

G Only one pair of opposite angles is congruent. ✗

H Each pair of opposite angles is supplementary. ✗

J There are four right angles. ✗

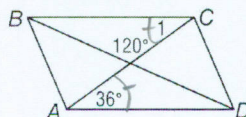
5. For parallelogram
- $ABCD$
- , find
- $m\angle 1$
- .

A 60

B 54

C 36

D 18



- 6.
- $ABCD$
- is a parallelogram with diagonals intersecting at
- E
- . If
- $AE = 3x + 12$
- and
- $EC = 27$
- , find the value of
- x
- .

F 5

G 17

H 27

J 47

$$3x + 12 = 27$$

$$3x = 15$$

$$x = 5$$

7. Find the values of
- x
- and
- y
- so that this quadrilateral is a parallelogram.

A $x = 13, y = 24$ C $x = 7, y = 24$ B $x = 13, y = 6$ D $x = 7, y = 6$

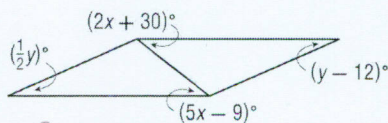
$$\frac{1}{2}y = y - 12$$

$$24 = y$$

$$2x + 30 = 5x - 9$$

$$39 = 3x$$

$$13 = x$$



8. Find the value of
- x
- so that this quadrilateral is a parallelogram.

F 12

$$2x + 60 = 4x - 12$$

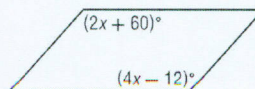
H 36

G 24

$$72 = 2x$$

J 132

$$36 = x$$



- 9.
- $ABCD$
- is a rectangle. If
- $AC = 5x + 2$
- and
- $BD = x + 22$
- , find the value of
- x
- .

F 5

G 6

H 11

J 26

$$5x + 2 = x + 22$$

$$4x = 20$$

$$x = 5$$

1. B

2. G

3. D

4. F

5. C

6. F

7. A

8. H

9. F

Unit 6 Review: Polygons (continued)

10. Which of the following is true for all rectangles?

10. D

A The diagonals are perpendicular. $\times$

C The consecutive sides are congruent. $\times$

B The diagonals bisect the angles. $\times$

D The consecutive sides are perpendicular. $\checkmark$

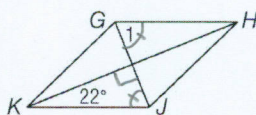
11. For rhombus $GHJK$, find $m\angle 1$.

A 22

B 44

C 68

D 90



$$\begin{array}{r} 90 \\ +22 \\ \hline 112 \end{array} \quad \begin{array}{r} 180 \\ -112 \\ \hline 68 \end{array}$$

11. C

12. The diagonals of square $ABCD$ intersect at E . If $AE = 2x + 6$ and $BD = 6x - 10$, find AC .

F 11

G 28

H 56

J 90

$$\begin{array}{l} 2(2x+6) = 6x-10 \\ 4x+12 = 6x-10 \\ 22 = 2x \\ 11 = x \end{array}$$

12. F

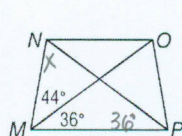
13. For isosceles trapezoid $MNOP$, find $m\angle MNP$.

F 44

G 64

H 80

J 116



$$\begin{array}{r} 44 \\ +36 \\ +36 \\ \hline 116 \end{array} \quad \begin{array}{r} 180 \\ -116 \\ \hline 64 \end{array}$$

13. G

14. The length of one base of a trapezoid is 19 inches and the length of the median is 16 inches. Find the length of the other base.

A 35 in.

B 19 in.

C 17.5 in.

D 13 in.

$$\frac{19+x}{2} = 16$$

$$\begin{array}{l} 19+x = 32 \\ x = 13 \end{array}$$

14. D

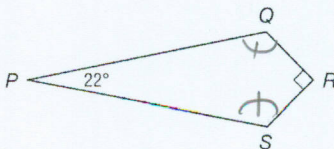
15. For kite $PQRS$, find $m\angle S$.

A 248

B 68

C 112

D 124



$$\begin{array}{r} 90 \\ +22 \\ \hline 112 \end{array} \quad \begin{array}{r} 360 \\ -112 \\ \hline 248 \end{array} \quad 248 \div 2 = 124$$

15. D

16. $ABCD$ is a parallelogram with coordinates $A(4, 2)$, $B(4, -1)$, $C(-2, -1)$, and $D(-2, 2)$. To prove that $ABCD$ is a rectangle, you would plot the parallelogram on a coordinate plane and then find which of the following?

F angles of the diagonals none

H slopes of the diagonals rhombus

G lengths of the diagonals rectangle

J midpoints of the diagonals parallelogram

16. G

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

$$(8-2)180 = 6(180) = 1080 = 1080$$

17. 1080°

18. 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 .

$$\begin{array}{l} (5-2)180 = 540 \\ 5x-12 + 2x+100 + 4x+16 + 6x+15 + 3x+41 = 540 \\ 20x + 160 = 540 \end{array}$$

18. 19

Unit 6 Review: Polygons (continued)

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

$$\frac{(n-2)180}{n} = 171$$

$$180n - 360 = 171n$$

$$-360 = -9n$$

$$40 = n$$

19. 40

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

$$x + 12 = 6x - 18$$

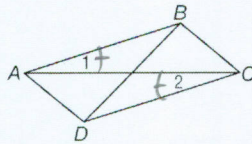
$$30 = 5x$$

$$6 = x$$

$$m\angle 1 = x + 12$$

$$= 6 + 12$$

$$= 18$$

20. 18

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

$$360 \div 45 = 8$$

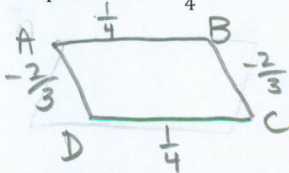
21. 8°

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

$$\begin{array}{r} 180 \\ - 58 \\ \hline 122 \end{array}$$

22. 122°

23. 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.

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

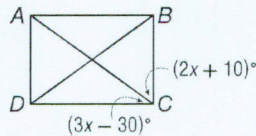
24. Given rectangle $ABCD$, find the value of x .

$$3x - 30 + 2x + 10 = 90$$

$$5x - 20 = 90$$

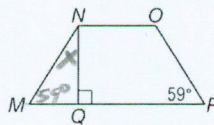
$$5x = 110$$

$$x = 22$$

24. 22

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

$$\begin{array}{r} 90 \\ + 59 \\ \hline 149 \end{array} \quad \begin{array}{r} 180 \\ - 149 \\ \hline 31 \end{array}$$

25. 31°

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

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

$$12x - 46 = 26$$

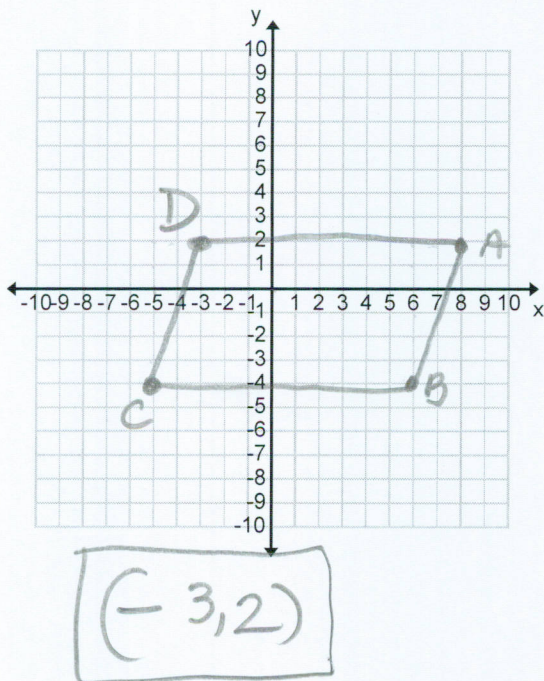
$$12x = 72$$

$$x = 6$$

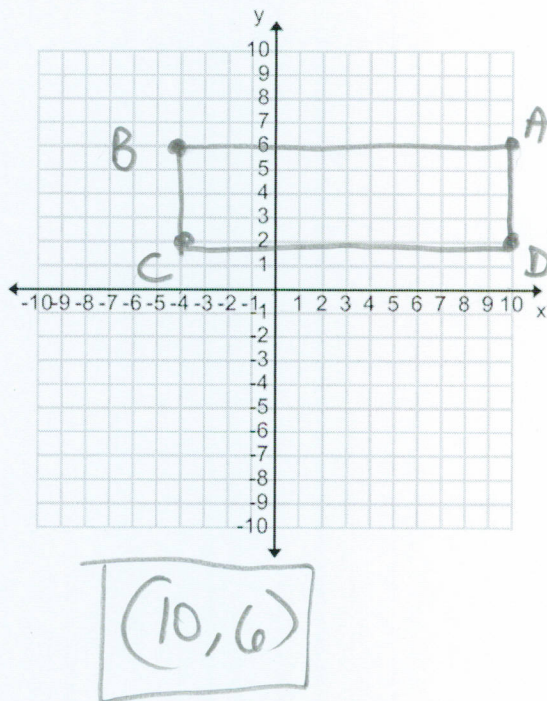
26. 6

Unit 6 Review: Polygons (continued)

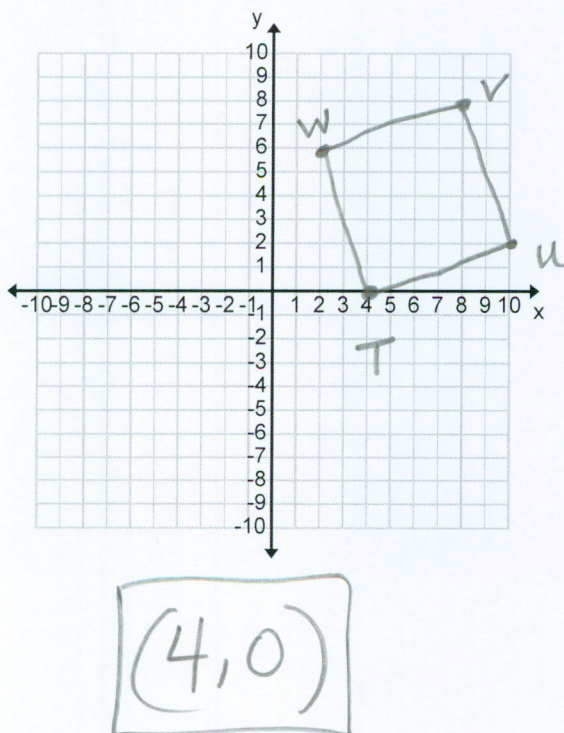
27. Parallelogram $ABCD$ has vertices $A(8, 2)$, $B(6, -4)$, and $C(-5, -4)$. Find the coordinates of D .



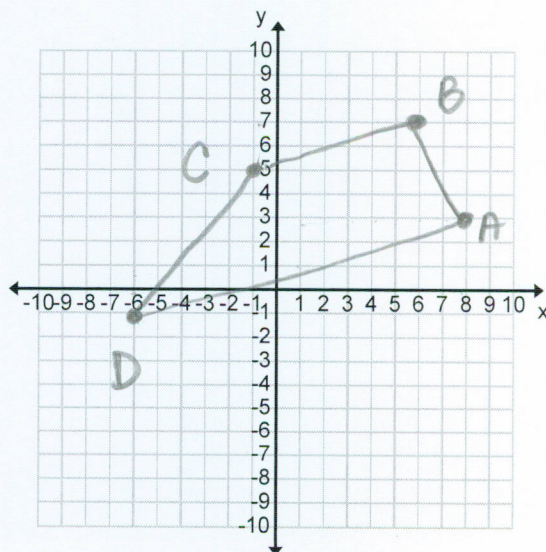
28. $ABCD$ is a rectangle with $B(-4, 6)$, $C(-4, 2)$, and $D(10, 2)$. Find the coordinates of A .



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



30. $ABCD$ 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.



$ABCD$ is a trapezoid because $\overline{CB} \parallel \overline{DA}$. They both have slopes of $\frac{2}{7}$.