# ANSWERS

Geometry Chapter 5 Practice Test

Name_____Period____Date_____

**For full credit, state the Theorem or rule you used to find your answer.**

1. How many triangles are formed by drawing diagonals from one vertex in the polygon? What is the sum of the measures of the angles in the polygon?

5 triangles

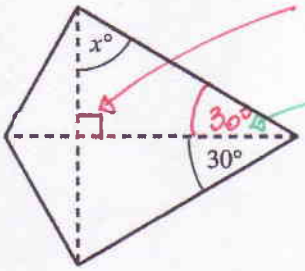
$5 \times 180^\circ = 900^\circ$ (angles of a triangle add up to 180°)

[A] 5; 1080° [B] 6; 1080° [C] 6; 900° [D] 5; 900°

2. Find the number of sides of a convex polygon if the measures of its interior angles have a sum of 2340°.

3. How many sides does a regular polygon have if the measure of each exterior angle is equal to 30°?

4. The figure below is a kite.




What is the value of $x$?

90° (diagonals of a kite are perpendicular)

diagonals of a kite bisect vertex angles

$x + 90 + 30 = 180^\circ$ [angles of a triangle add up to 180°]

$x + 120 = 180^\circ$

$-120 \quad -120$

$x = 60^\circ$

#2

$\frac{180(n-2)}{180} = \frac{2340}{180}$ (the sum of interior angles of a polygon)

$n - 2 = 13$

$+2 \quad +2$

$n = 15$

The polygon has 15 sides

#3

The sum of the exterior angles of any polygon is 360°

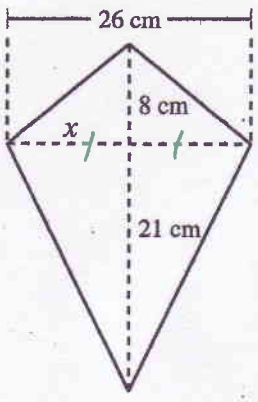
Let n be the number of sides (angles) of the polygon.

$\frac{30^\circ n}{30} = \frac{360^\circ}{30}$

$n = 12$

The polygon has 12 sides.

5. The dashed lines inside the figure are the diagonals of a kite.



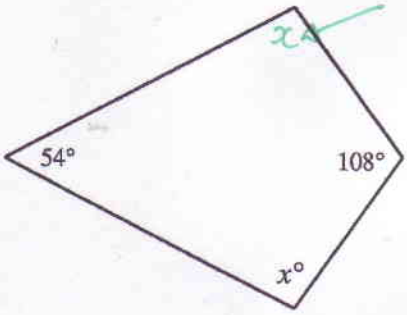

What is the value of $x$?

$x = \frac{26}{2}$

$x = 13$

The diagonal connecting the vertex angles of a kite is bisecting the other diagonal.

6. The figure shown is a kite.




What is the value of $x$?

non-vertex angles of a kite are congruent.

$x + x + 108 + 54 = 360$ (angles of a quadrilateral add up to 360°)

$2x + 162 = 360$

$-162 \quad -162$

$\frac{2x}{2} = \frac{198}{2}$

$x = 99$

or

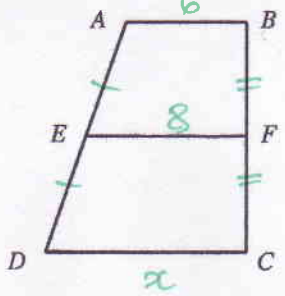
$360° - (108 + 54)$

$360 - 162$

$198$

$198 \div 2 = 99$

7. Trapezoid $ABCD$ contains midsegment $\overline{EF}$. If $AB = 6$ inches and $EF = 8$ inches, find the length of $\overline{DC}$.




The midsegment of a trapezoid is equal in length with half of the sum of bases' lengths.

$2 \cdot 8 = \frac{6 + x}{2} \cdot 2$

$16 = 6 + x$

$-6 \quad -6$

$10 = x$

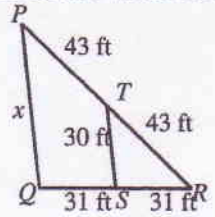
or

$2 \cdot 8 = 16$

$16 - 6 = 10$

(The double of the length of the midsegment is equal to the sum of bases' lengths)

8. Find the value of $x$. [A] 37 ft [B] 30 ft [C] 31 ft [D] 60 ft

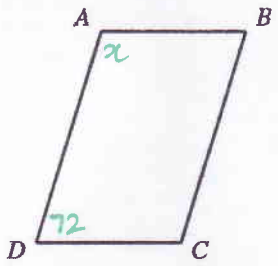



$x = 2 \cdot 30$

$x = 60$

Midsegment of a triangle is half the base length.

9. $ABCD$ is a parallelogram. If $m\angle CDA = 72°$, find $m\angle DAB$.



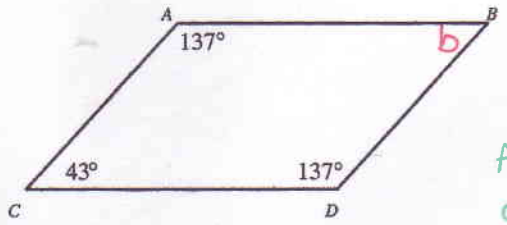

$72 + x = 180$

$-72 \quad -72$

$x = 108$

Consecutive angles of a parallelogram add up to 180°.

10. Tell whether the quadrilateral is a parallelogram. Explain your reasoning.



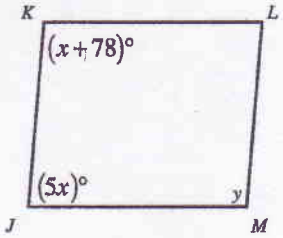

$137 + 137 + 43 = 317$ (angles of a quadrilateral add up to 360°)

$b = 360° - 317$

$b = 43$

ABDC is a parallelogram because the opposite angles are congruent.

11. Find the value of $y$ using the parallelogram below.




Consecutive angles of a parallelogram add up to 180°.

$x + 78 + 5x = 180$

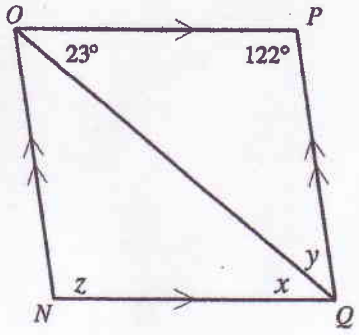
$6x + 78 = 180$

$-78 \quad -78$

$\frac{6x}{6} = \frac{102}{6}$

$x = 17$

12. Find the value of the variables in the parallelogram.




$x = 23°$ (AIA = alternate interior angles congruent)

$z = 122°$ (opposite angles of a parallelogra are congruent)

$y = 180° - (122 + 23)$ (angles of a triangle add up to 180°)

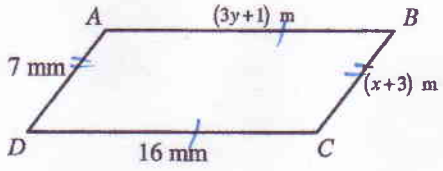
$y = 180 - 145$

$y = 35$

[A] $x = 11.5°,\ y = 61°,\ z = 157°$ [B] $x = 35°,\ y = 23°, z = 122°$

[C] $x = 61°,\ y = 11.5°,\ z = 157°$ [D] $x = 23°,\ y = 35°,\ z = 122°$

13. Find the value of $x$ and $y$ given figure $ABCD$ is a parallelogram.




1m = 1000 mm

Opposite sides of a parallelogram congru

$\frac{1000(3y+1)}{1000} = \frac{16}{1000}$

$3y + 1 = .016$

$-1 \quad -1$

$\frac{3y}{3} = \frac{-.984}{3}$

$y = -.328$

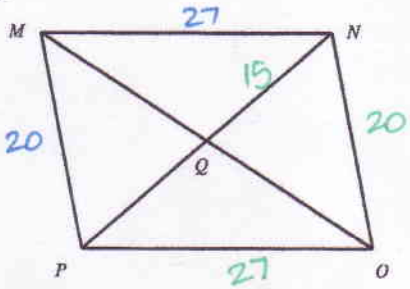
$\frac{1000(x+3)}{1000} = \frac{7}{1000}$

$x + 3 = .007$

$-3 \quad -3$

$x = -2.993$

14. In the parallelogram below, $QN = 15$ inches, $NO = 20$ inches, and $PO = 27$ inches. Find the perimeter of $\Delta NMP$.




$MN = 27$, $MP = 20$ [opposite sides of a parallelogram are congruent]

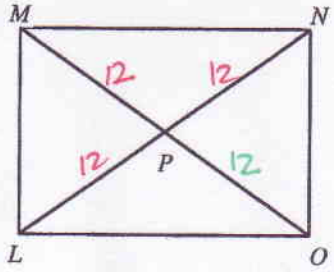
$PQ = QN = 15$ [diagonals of a parallelogra bisect each other]

So, $PN = 30$

The perimeter of $\Delta NMP = 27 + 20 + 30$

$= 77$

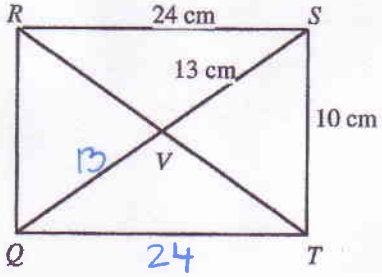
15. This is a rectangle. If $OP = 12$ inches, what is the length of $\overline{LN}$?




The diagonals of a rectangle are congruent and bisect each other.

$LN = LP + PN = 12 + 12 = \boxed{24}$

16. Find the perimeter of $\Delta TVQ$, given $QRST$ is a rectangle.

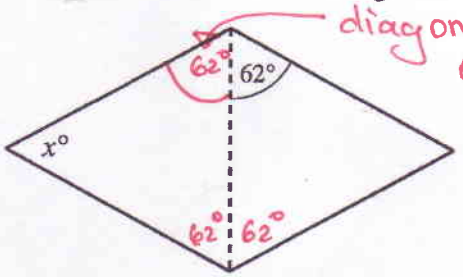



$QT = 24$ (Opposite sides of a rectangle are congruent)

$QV = VS = 13$ (The diagonals of a rectangle are congruent and bisect each other)

The perimeter of $\Delta TVQ = 13 + 13 + 24 = \boxed{50}$

17. The dashed line is one of the diagonals of the rhombus.




What is the value of $x$?

diagonals of a rhombus bisect the angles

Opposite angles of a rhombus are congruent

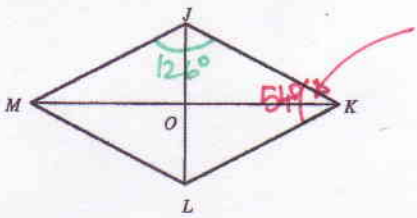
$62 + 62 + x = 180°$ (triangle angles add up to 180°)

$124 + x = 180$

$-124 \quad -124$

$\boxed{x = 56}$

18. $MJKL$ is a rhombus. If $m\angle MJK = 126°$, what is the measure of $\angle JKM$?




Consecutive angles of a rhombus add up to 180°

$180° - 126° = 54$

- The diagonals of a rhombus bisect the angles.

$m(\angle JKM) = 54°/2 = 27°$

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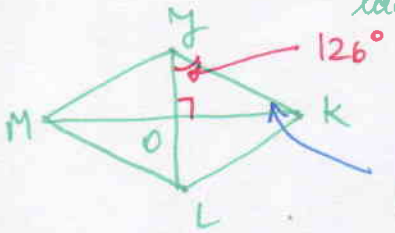
#18. Diagonals of a rhombus are perpendicular and bisect each other.




$126° \div 2 = 63$

$180° - (90 + 63) = 180° - 153° = \boxed{27°}$

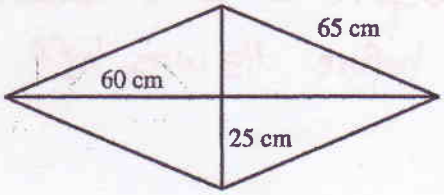
(angles of a triangle add up to 180°)

• Diagonals of a rhombus bisect each other.

$25 \times 2 = 50$

$60 \times 2 = 120$

19. The figure below is a rhombus.




• All sides of a rhombus are congruent.

$4 \times 65 = 260$

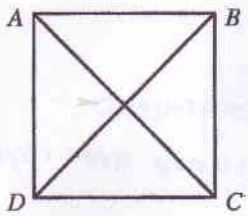
The total length is:

$260 + 50 + 120 = \boxed{430}$

What is the total length of the perimeter and both diagonals of the rhombus?

20. When his family had a rummage sale, Marvin sold soda pop. When only one-fifth of the soda pop was left, he put 21 more cans in the cooler. After that Marvin sold 20 cans. At the end of the day, 6 cans of soda pop were left. How many cans were in the cooler at the beginning of the sale?

21. Write a paragraph or two-column proof to show that the diagonals of a square are congruent. Use the diagram and labels to set up what is given and what is to be shown.




#20 Solution 1 – using an equation

Let $x$ be the number of cans in the cooler at the beginning of the sale.

only one-fifth left: $\frac{1}{5}x$

add 21 more: $\frac{1}{5}x + 21$

20 sold: $\frac{1}{5}x + 21 - 20 = \frac{1}{5}x + 1$

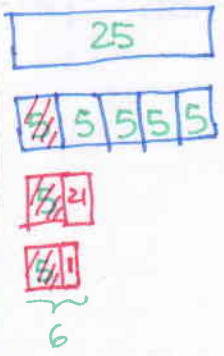
6 left: $\frac{1}{5}x + 1 = 6$

$-1 \quad -1$

$5 \cdot \frac{1}{5}x = 5 \cdot 5$

$\boxed{x = 25}$

Solution 2 graphic representation




beginning

1/5 left

add 21

sold 20

6 left

#20 Solution 3 - working backwards.

6 left : 6 cans

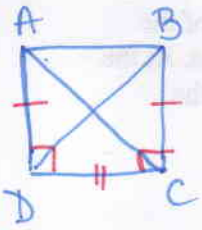
20 sold : 6+20 = 26 cans before 20 were sold

21 added : 26-21 = 5 cans before 21 were added

1/5 left : 5×5 = 25 cans before 1/5 was left.

start : 25 cans

#21




Given : ABCD square

Show : $\overline{AC} \cong \overline{BD}$

| Statement | Reason |
|---|---|
| 1. ABCD square | 1. Given |
| 2. $\overline{AD} \cong \overline{BC}$ | 2. All sides of a square are congruent |
| 3. $\angle D \cong \angle C$ | 3. Equal 90°. All angles of a square are right angles. |
| 4. $\overline{DC} \cong \overline{DC}$ | 4. Shared side |
| 5. $\triangle ADC \cong \triangle BCD$ | 5. SAS |
| 6. $\overline{AC} \cong \overline{BD}$ | 6. CPCTC. |